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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Transport of Acids

WE so frequently receive enquiries in connection with the transport and handling of acids and other corrosive substances that it will be a matter of interest for our readers to hear that Mr. F. Hirsch, who is well known in chemical engineering circles and is chief chemist of the United Alkali Company's works at Newcastle-on-Tyne, is now engaged in writing a volume on this subject for the new series of the *Chemical Engineering Library*, which is being published by Ernest Benn, Ltd. It will be a great advantage to works managers and others to have all the information relating to the matter collected in easily assimilable form in one of these little handbooks, for at present but a sparse amount of literature of an authoritative and practical nature is available, while official regulations and strictures are not always as lucid as they might be. It will, too, be generally agreed that, owing to the official capacities in which he has served, Mr. Hirsch is particularly well equipped for writing on the subject, which in all probability will ultimately be dealt with in two volumes, the first relating to mineral acids and the second to organic acids.

Only within the last few days we were asked for information in connection with the transport of nitric acid in bulk, our questioner obviously being under the misapprehension that methods similar to those employed with sulphuric acid might quite safely be utilised. There would almost seem, in fact, to be a lack of knowledge on such matters which one would scarcely expect to find. It should be almost unnecessary to have to point out that when dealing with nitric acid it is only possible to use glass containers since iron is very rapidly corroded by it. When carboys are used for the purpose it is a common custom to saturate the baskets and straw packing with a 10 per cent. solution of Glauber salts, silicate of soda, calcium chloride or some such medium. A more recent practice is that of inserting the carboys in thin sheet-iron cases, to which an iron lid is fitted, the grips for the carboy being covered with asbestos; consequently if breakage occurs the acid is retained in the case, while the cover precludes any large volume of nitrous gases from escaping. The great merit of this style of packing is, however, the immunity which is secured for other carboys in the same consignment. When mixtures of nitric acid and sulphuric acid have to be dealt with it is, of course, possible to employ iron vessels for transport or storage, as the extent of the corrosive action is but very slight.

United Alkali Developments

THERE is one aspect of the annual report of the United Alkali Co. which may well be commended to the directors of all similar concerns. That is the open-eyed recognition of changing market conditions and of any possible menace from improved foreign processes or methods of production. If the British alkali industry had been blind to such considerations in its earlier days, as too many manufacturing concerns still are, its survival might have been threatened; that it has not only survived but gone on consistently progressing and expanding is due to the fact that it has kept pace with progress and measured itself against the best competition, and by the aid of science, technology, and good business management has always been able to do a little better than the best of its rivals. As a result, not only have the directors and shareholders material cause for continued satisfaction but a good

example is set for others, and British industry gains in reputation throughout the markets of the world.

There is, in Sir Max Muspratt's survey of the year's activities, another feature that deserves recognition. Owing to a fall in the cost of production, in itself a sign of good management, the prices of various products were reduced to the consumer, and it is satisfactory to hear that the return in increased trade has come more quickly than was anticipated and has fully justified the reductions. A shorter-sighted policy might have preferred increased profits for the moment and left the future to take its chance; the longer-sighted policy regards the interests of the consumer and thus secures in the support and contentment of an increasing constituency of customers the future success of the undertaking. Among the possible future developments, particular interest attaches to Sir Max Muspratt's reference to the dyestuffs industry. From the beginning he has emphasised the importance of the closest co-operation between the dyestuffs and the heavy chemical industries; the subject was developed very thoroughly in the address he delivered some eighteen months ago before the Society of Dyers and Colourists. It is encouraging to hear of the friendlier relations which have grown up recently, and though no details are yet available it seems clear from certain phrases that the United Alkali Co. may presently come into a much more direct relation to dyestuffs production than is the case to-day.

One further point may be noted—the harmonious relations of directors, staff, and workpeople. How much this counts for in securing success can never be exactly tabulated; it is something too fluid and subtle to be expressed in statistical terms. Yet it is one of the vital elements of good organisation, and creates the only atmosphere in which the human factor reaches its full effectiveness. Sir Max Muspratt is among the too small band of enlightened industrial leaders who have consistently pleaded against the loss of the human unit in the great industrial and economic machinery of modern times. Still more, throughout the United Alkali works the Chairman's theory has long been the company's practice, and to this human fellowship in industry must be attributed largely the successes of the past and the good prospects of the future.

"Hand and Mechanical Burners"

THE symposium on hand and mechanical burners for the combustion of sulphur-containing materials, arranged by the Chemical Engineering Group at Birmingham this week, cannot be regarded as other than timely, and the conference was a distinct success. It is impossible to review all the interesting considerations raised, but opportunity to refer to some of these will probably recur. For the present we are more concerned with the matter of hand *versus* mechanical burners. Perusal of the principal paper makes it clear that the controversy does not apply to all sulphur-containing materials with the same degree of acuteness. It is generally conceded that mechanical burners are to be preferred for the combustion of sulphur and zinc blende. The dust problem does not arise with the first-named material, and labour costs render imperative the adoption of mechanical means for the latter. Thus the problem is narrowed materially, and chiefly centres around spent oxide and pyrites. The paper by Mr. J. Harries raised definite issues concerning the latter materials, but what is required is a comparison of like with like.

Few works operate a mechanical furnace roasting 20-30 tons of spent oxide per day. Far more treat 10-15 tons per day in mechanical burners. When operating costs are contrasted on the latter basis the difference in favour of mechanical burners over hand is not appreciable. Where hand burners score is in the absence of mechanical repairs, unbroken continuity of operation, conservation of heat, gratuitous concentration of a large proportion of the acid made, and the manufacture of a product which is of good colour and saleable. On the other hand, mechanical burners give a better combustion efficiency. Where cheap concentration and a good colour Glover acid are minor considerations, as is the case with several superphosphate works, mechanical burners have a better chance of adoption. This does not arise from any collateral merit, but is due to a limitation of the considerations which would otherwise govern the selection of the two types of burners.

Where chemical works have to provide for the supply of 140° Tw. acid to gasworks and coke ovens—and there are many such works in this country—the question of inexpensive concentration and the production of good coloured Glover tower acid are factors of paramount importance. It is an easy matter to gain a few pence per ton in respect of labour by the adoption of mechanical burners as compared with the hand type (Mr. Smy instanced 4s. 3d. per ton for operation costs, and repairs and renewals, in the case of hand spent oxide burners, and 3s. 8½d. per ton, labour, repairs and running charges for mechanical burners), and to lose 5s. to 6s. per ton on account of the dust trouble, to which Mr. Smy referred, and which is emphasised by Mr. Parrish.

Judging by Mr. Parrish's paper, it would appear that the dust trouble arising from mechanical burners for spent oxide has, to a large extent, been overcome at one or two works, but it is still acute where pyrites combustion is effected in mechanical furnaces. He points out that if the creation of dust is to be arrested the falling pyrites under combustion must not come in contact with the ascending burner gases, and that the gas velocities within the burners must be reduced. He cites the Bracq-Laurent furnace as embodying scientific principles calculated to afford a solution of the dust problem, and he suggests that this burner represents a distinct progressive step in technique. The papers and discussion were all peculiarly interesting and should well repay careful study.

Bromine from the Sea

TO overcome the shortage of bromine, which threatens to affect both industry and science, the steamship *Ethyl*, equipped as a complete chemical plant, will, it was announced from New York, sail on April 15 in quest of this raw material which is regarded as essential to medicine, to motion pictures, to photography, and to the ethyl fluid of motor fuel. Refitted

as a factory for recovering bromine from sea-water, the *Ethyl*, formerly the *Lake Harminia* of the United States Shipping Board, will leave Wilmington, Del., on what is probably the strangest voyage ever undertaken by a vessel of commerce. She will call at no port, and, roaming the ocean, will extract her cargo from its waters. Chemical experts who are members of the American Chemical Society estimate that 1,700 gallons of sea-water contain 1 lb. of bromine, and it is the *Ethyl's* mission to extract this proportion of bromine from the sea-water.

In an official announcement, Mr. A. M. Maxwell, vice-president of the Ethyl Gasoline Corporation, the owners of the vessel, states that an entirely new process of bromine extraction will be employed. This process is expected to yield on the *Ethyl* 100,000 lb. of bromine per month. To produce this quantity the *Ethyl* will draw aboard 7,000 gallons of sea-water a minute. "The voyage," Mr. Maxwell states, "is an experiment unique both in chemical manufacture and in commercial navigation. The success of this venture may give an entirely new aspect to the manufacture of bromine, which hitherto has been laboriously recovered from mineral springs and from the potash deposits of Germany. Success, furthermore, may mean the equipping of a fleet of bromine ships and the creation of floating chemical industries for the recovery from the seas of other valuable constituents. The *Ethyl*, of 4,300 tons capacity, was purchased from the U.S. Shipping Board at a price comparable to or even below that at which land could be purchased for the plant it carries. So great a quantity of water is drawn in that the recovery plant has been built in the ship; by placing the machinery actually at or below the water line the energy required for pumping sea-water is reduced to a very low point. Further, the effluent is readily dissipated, thus completely avoiding the problem of sewage disposal. Also, when on the high seas, there will be no difficulty from fumes, another prolific source of trouble." Laboratory tests, it is said, have proved the practicability of the new process; in any event the experiment is one of great interest.

The Twenty-six per cent. Levy

CHEMICAL importers will hear with relief of the new plan under which they will be relieved of the troublesome duty of paying direct to the Customs 26 per cent. of the value of any German goods they import and the balance of 74 per cent. to the exporter. The German exporters have come to an arrangement with their own Government whereby the amount of the levy will be surrendered at their end and the amount due to this country paid over monthly to the Agent-General of the Bank of England. As soon as the new plan becomes operative importers will be able to deal with German firms very much as with firms of other nations, and a considerable amount of trouble will be saved, though, for the purpose of collecting the levy and the settlement of monthly accounts between the two nations, particulars of all German imports will, of course, have still to be obtained. It is to be hoped, for the advantage of trade, that the German traders will loyally carry out their undertaking.

Points from Our News Pages

The combustion of sulphur-containing materials is dealt with in a paper by Mr. P. Parrish (p. 350).

Further reports of the Board of Trade inquiry into the question of a protective duty on superphosphates (p. 352).

Important recent developments in the British alkali industry and others already in contemplation are mentioned in Sir Max Muspratt's speech from the chair at the annual meeting of the United Alkali Co., Ltd. (p. 354).

The question of the sale of the Billingham nitrogen factory has again been raised in the House of Commons (p. 355); other Parliamentary news of chemical interest (p. 359).

Dr. E. F. Armstrong urged a federation of chemists in his Birmingham address on "The Profession of Chemistry" (p. 356).

Dr. Lander surveys the question of fuel research, particularly smokeless fuels (p. 357).

Professor W. A. Bone outlines three ways in which chemists could investigate coal, in his lecture before the Society of Chemical Industry in London (p. 359).

The death is announced of Mr. J. A. E. Rayner (p. 369) and Mr. H. Ellison (p. 360).

In the Scottish market business in heavy chemicals has been fairly satisfactory, with good inquiry for home and export trade (p. 367).

Conditions and prices on the London market may be taken to be generally unchanged from last week (p. 368).

Books Received

LABORATORY MANUAL OF ORGANIC CHEMISTRY. By Harry L. Fisher. London: Chapman and Hall, Ltd. Pp. 338. 11s. 6d.

PRACTICAL ADVICE TO INVENTORS AND PATENTEES. By C. M. Linley. London: Sir Isaac Pitman and Sons, Ltd. Pp. 124. 3s. 6d.

THE MODERN SOAP AND DETERGENT INDUSTRY.—Vol. II. The Manufacture of Special Soaps and Detergent Compositions. By Geoffrey Martin. London: Crosby Lockwood and Son. Pp. 368. 36s.

INTRODUCTION TO ORGANIC RESEARCH. By Professor E. Emmet Reid. London: Constable and Co., Ltd. Pp. 343. 24s.

LOW TEMPERATURE DISTILLATION. By Sydney H. North and J. B. Garbe. London: Sir Isaac Pitman. Pp. 216. 15s.

PRACTICAL HUMIDITY TABLES. Compiled by the Technical Staff of A. B. Cleworth and Co., Ltd. London: Taylor and Francis. Pp. 124. 6s.

REPORTS OF THE PROGRESS OF APPLIED CHEMISTRY, Vol. IX, 1924. Issued by the Society of Chemical Industry. Pp. 680. 7s. 6d. to members, 12s. 6d. to non-members.

The Calendar

1925 Apr. 16	Northampton Polytechnic Institute: "The Metallography and Heat Treatment of Iron and Steel"—Tool Steels. R. Genders. 7 p.m.	St. John Street, London, E.C.1.
16	Coke Oven Managers' Association (Midland Section): "The Combustibility and Reactivity of Coke." Dr. R. V. Wheeler.	The University, Sheffield.
20, 27 & May 4	Royal Society of Arts. Howard Lectures: "Motor Fuels." Professor J. S. S. Brame.	John Street, Adelphi, London.
Apr. 22	Institution of Chemical Engineers: "Continuous Petroleum Distillation." A. M. O'Brien.	—
22	Society of Glass Technology: Annual General Meeting.	Sheffield.
23	Oil and Colour Chemists' Association: "Some Problems of the Paint and Rubber Industries." B. D. Porritt.	8, St. Martin's Place, Trafalgar Square, London.
23	Northampton Polytechnic Institute: "The Metallography and Heat Treatment of Iron and Steel"—Defects in Steels. R. Genders. 7 p.m.	St. John Street, London, E.C.1.
24	Institute of Metals (Swansea Section): Annual General Meeting. 7.15 p.m.	University College, Swansea.
24	Institute of Metals (Sheffield Section): Annual General Meeting. "Chromium Plating." Byron Carr. 7.30 p.m.	The University, St. George's Square, Sheffield.

The Combustion of Sulphur-Containing Materials

Paper by Mr. P. Parrish, M.I.Chem.E.

At the conference of the Chemical Engineering Group of the Society of Chemical Industry held in Birmingham on Tuesday, the question for discussion was "The Combustion of Sulphur-Containing Materials in Hand and Mechanical Burners," on which papers were presented by Mr. P. Parrish, Mr. J. Harries, and Mr. G. A. Smy.

The substance of Mr. Parrish's paper is given below.

No hard and fast rule (Mr. Parrish stated) could be applied to the selection of the type of burner for the combustion of "sulphur-containing materials," which meant sulphur, spent oxide, pyrites and zinc blende or concentrates.

The qualities of sulphur available in this country were Sicilian thirds sulphur, Freeport, Union, and Texas Gulf. There was also produced a small quantity of recovered sulphur from Claus kilns, and several thousand tons per year of black recovered sulphur are available. Black recovered sulphur could not suitably be burned in rotary mechanical sulphur burners, on account of its ash content. It could be used to advantage for fortifying low-grade spent oxide, and employed for the manufacture of sulphuric acid, with suitably designed tray burners. The important consideration was to provide such supplies of primary and heated secondary air as not only obviated sublimation, but ensured that no unburnt carbon passed forward to the Glover tower. The presence of carbon was noted in lesser degree with the sulphur from the three American sources, as they all contained traces of oil. Oil-containing sulphur would only burn for a very short time before a thin elastic film formed over its surface. Sulphur and oil reacted at moderate temperatures, and a sort of asphalt was formed, but should combustion continue carbon would invariably be found as a residue. With oil-containing sulphur a form of burner should be adopted which agitated the surface of the burning sulphur, thus breaking the asphaltic pellicle, when combustion again proceeded.

Pressure Sulphur Burners

In the manufacture of alkaline sulphites or bisulphites, for the bleaching of sugar beet, glue, etc., pressure sulphur burners were employed. The function of the initial pressure was to overcome the resistance of the liquid seal of the distribution or "cracker" pipes, contained in suitable vats or containing vessels. Whether it was better to work with an initial pressure involving the use of an air compressor or blower, or with a suction which necessitated an exhauster, was a matter of some controversy. Difficulties certainly attended the latter method. Rarely were the exit gases free from sulphur dioxide, and the suction fan or exhauster usually suffered somewhat severely. Corrosion of certain parts was peculiarly prone to arise, and repairs, although small in character, were costly, and disturbed the continuity of normal working. Occasionally, where lead-lined vessels had to be used, on account of the purity of the product required, working under suction created difficulties, because the sides of the vessel or saturator were withdrawn from their supporting media, buckling occurred, and repairs, and not infrequently renewals, became necessary. These disabilities were not associated with a plant provided with positive pressure sulphur burners. For the economical working of the latter, an air compressor could be used in conjunction with an air receiver, the relief valve of which was set to release at a slightly higher pressure than that required to overcome the resistance of the seal, or cumulative seals, and the skin friction of the plant. In this way a uniform pressure of air was fed to the pressure sulphur burner. There were two or three makes of this type of burner on the market in this country—the Humphries, the Newton-Chambers, and the Sachsenburg.

Principles of Design

The underlying principles involved in the design of these burners were shortly described :—

1. The passage of heated air and sulphur dioxide, caused by the initial combustion of sulphur, through a rain of molten sulphur, caused ignition. After the starting of the burner, a valve, which usually controlled the feed of sulphur from a suitable receptacle, was opened. The heat of the burner gases which travelled around or adjacent to the receptacle melted the sulphur. It fell in a molten condition in drops into a tray. In its passage the sulphur became ignited.

2. The supply of primary air to the tray was a matter of importance, as uniformity of distribution over the surface of the burning sulphur was essential if the combustion was to be maintained and to be effectual. The greater the rapidity with which sulphur dioxide was removed, so that the particles of sulphur could present fresh surfaces for oxidation, the better would combustion be promoted.

3. Sublimation in such burners might arise in various ways. An attempt might be made to work the pressure sulphur burner too intensively. Thus high temperatures and high sulphur dioxide concentrations were reached, and vaporisation of the sulphur took place. Obviously, volatilised sulphur could not be burned in a reducing atmosphere. Experience showed that concentrations of sulphur dioxide of 15 to 18 per cent. gave rise to sublimed sulphur. The remedy was not always the application of a secondary supply of air, heated or otherwise. The velocity of the gases might contribute in some measure to the entrainment of the volatilised sulphur.

4. The rate at which the sulphur was burned was a fundamental consideration. The surface area of the tray, to a large extent, governed the capacity of the burner, although other factors operated such as the provision of heated primary and secondary air, extent of agitation, and the regularity or otherwise with which the molten sulphur was fed.

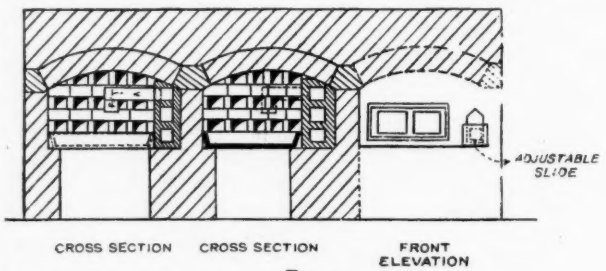

FIG. 1

The following particulars related to the Sachsenburg burner, and represented the relation between the quantity of sulphur burned per 24 hours and the grate area :—

No.	0	1	2	3	4	5
Quantity of sulphur burned in 24 hours, lb. approx.	75	115	185	280	510	935
Grate area of burner. Diam. in sq. metres..	0·14	0·21	0·34	0·52	0·94	1·72

These figures represented the combustion of 50 lb. of sulphur per square foot of tray surface per hour. Experience suggested that this was a throughput, unattainable in practice, without sublimation occurring. Other firms preferred to base on approximately 7 to 10 lb. of sulphur per square foot of grate surface per hour. This certainly admitted of greater latitude for intensive working, without difficulty arising from sublimation.

Hand Sulphur Burners

Fig. 1 showed a sulphur burner designed by the author, in which the charging of the sulphur was effected by hand, and took place every ten minutes. The primary air for combustion was introduced through the slides in the charging doors, and secondary air was admitted through the adjustable port at the right-hand side of the burner, and was preheated in its passage through the zig-zag flues at the side. This preheated secondary air emerged at a point where the sulphur-dioxide-air mixture was about to enter the incandescent chequer brickwork. Thus agitation and inter-mixing were promoted, and combustion of any sublimed sulphur was

ensured. The ash which accumulated in the tray was removed every day. About 4 lb. of sulphur per square foot of tray surface per hour was obtained. A reasonably uniform gas composition, of 8 to 10 per cent. of sulphur dioxide, could be maintained without difficulty, and the operation of the sulphuric acid plant proceeded with remarkable regularity.

It was not a difficult matter to design a sulphur burner which had a series of two or more superposed trays. The "Vesuvius" sulphur burner and the "Kestner" burner (Prentice patent) were examples of this kind. The production of sulphur dioxide for oleum manufacture was a different proposition from that for a chamber sulphuric acid plant. Greater regularity and uniformity were required, and a minimum production of sulphur trioxide is a desideratum.

Mechanical Sulphur Burners

These assumed several forms, but it was only necessary to give particulars of the outstanding principles and design involved. Whether the rabbling of sulphur was eminently desirable was a doubtful point. Sulphur melted at a temperature below its ignition point. Whether it was fed into the burner in lumps or powder, or in a molten condition, determined to a large extent whether the feeding apparatus should be mechanical in character or not. Where the feeding was mechanical, grinding of the sulphur would be necessary, because very few worm feeds were capable of dealing with the large lumps invariably associated with all cargoes of sulphur. The grinding of sulphur needed to be conducted with care, and it was desirable to feed the sulphur over a magnetic table before it reached the crushing rollers. Fires and slight explosions were known to have originated from the presence of pieces of iron associated with the sulphur fed to crushing plants, without magnetic separation. Molten sulphur was adhesive, and advantage was taken of this property in mechanical rotary burners, which had been in extensive use in America for several years, but their introduction to this country was only of comparatively recent date. A burner of the Newton-Chambers type, 4 ft. wide and 20 ft. long, would burn under normal conditions about half a ton of sulphur.

Hand *v.* Mechanical Burners

There could be no doubt that burners which admit of a continuous feed of sulphur, either in granular form or as molten sulphur, were to be desired from all points of view. Labour costs were reduced appreciably, burner gases of any concentration from 5 to 15 per cent. could be obtained with uniformity, and the plant to which the burner or set of burners was attached could be operated with clock-like regularity. The efficiency of combustion exceeded 99·5 per cent. One need not hesitate to instal mechanical sulphur burners, because there was no dust problem such as arose when spent oxide or pyrites are the raw materials. Although the initial cost of hand burners was somewhat less than mechanical burners, labour expenses were heavier and the same uniformity of conditions could not be maintained. For oleum plants combustion in mechanical burners was ideal from several points of view.

It was interesting to note that increasing quantities of brimstone were being used in this country, as was revealed by the following figures, which also showed the relative importance of the other two principal sources of sulphur dioxide:—Sulphur-containing materials used in the United Kingdom:

	1913	1923-24
Pyrites	800,000	350,000
Spent oxide	110,000	148,000
Sulphur	3,000	66,000

It was not economical to deal with spent oxide containing less than 40 per cent. of sulphur. Indeed, buyers usually specified a minimum content as 45 per cent. of sulphur, and not more than 10–12 per cent. of moisture. Large quantities of material were available containing 50 to 55 per cent. of tar-free sulphur.

Design of Hand Spent Oxide Burners

The following considerations were important in the design of hand-operated burners:—

(*a*) The distribution of the gases arising from the combustion of spent oxide should be so arranged that all the shelves are maintained at such a temperature as will admit of satisfactory combustion, and ready ignition of the spent oxide, when charged to the respective beds.

(*b*) Retention of heat of combustion is necessary, in order to render as wide a disparity as possible between the respective specific gravities of the burner gases on the one hand, and the fine dust particles entrained on the other.

(*c*) The travel of the gases should be diverted at right angles at as many points as possible. Such diversion will promote the deposition of the dust.

(*d*) The main flues should be as capacious as possible in point of size, so that the velocity does not exceed 4 lineal feet per second.

(*e*) Adequate provision should be arranged at the points where the direction of the gases is diverted, and the velocity is reduced, for the removal of the deposit at such points.

(*f*) The relation of the arm flue to the stalk is an important one, as it undoubtedly affects the uniformity of draught on the several beds.

(*g*) The shelves of the burners should be of such an area as to allow of the combustion of 1 lb. of spent oxide of 45 to 50 per cent. content per hour, per square foot of shelf area.

There were several excellent mechanical burners, suitable for the combustion of spent oxide. The "Harris," "Herreshoff," and 'Wyld" burners were those largely used in this country.

Pyrites and Pyrites Burners

Pyrites might be broadly divided into two classes—viz., iron pyrites and cupriferous iron pyrites. These two broad classes might be sub-divided into arsenical and non-arsenical. Since the war the quantity of pyrites used in the United Kingdom had decreased very sensibly. Sulphuric acid manufacturers had found sulphur and spent oxide much more economical materials.

Typical analyses of several qualities of pyrites were given in the subjoined table:

Origin of Pyrites.	Quality.	S. %	Cu. %	Fe. %	As. %	Pb. %	Zn. %	SiO_2. %
Norwegian	Foldal	47·0	2·0	42·0	0·04	—	0·5—0·7	6·0
Spanish	Hibera Fines	49·52	0·18	43·0	0·13	—	0·7	2·00
Norwegian	Bossmo	48·0	0·5	44·0	Traces	—	—	—
Norwegian	Malmaasen	46·48	1·0	42·0	Free	—	—	—
Greek	Pena	48·0	2·0	42·0	—	—	—	—
Portuguese	Aljustrel	47·5	0·4	41·35	0·33	1·05	1·4	4·0
Spanish	Seville	42·44	3·0	42·0	—	—	—	5·0
Spanish	Esperanza	46·0	1·7	41·0	0·03	—	—	—
Spanish	Rio Tinto	48·0	3·2—3·5	40·74	0·04 0·25	—	—	—

Some of the pyrites from certain of the Seville and Esperanza veins were explosive. Shortly after charging these ores to the burners they detonated and the fine powder formed was a prolific cause of the blockage of the interstices of the ore bed, thus leading to the formation of scars or clinker.

Lumps and Fines

The bulk of the lump ore as usually delivered was too large in size to be suitable for burning in lump ore burners. Crushing was therefore necessary, and the size which had been found best suited to lump pyrites burners was 2½ in. to 3 in. round. The disadvantage attending the breaking of a friable ore was the large amount of fines which resulted, especially if the plant for effecting the breaking was a mechanical one. Not infrequently with such an ore hand breaking was adopted, in order to reduce the quantities of fines to a minimum.

Hard pyrites, when hand broken, would not produce more than 6 to 8 per cent. of fines. If broken by a mechanical plant, possibly 12 to 14 per cent. of fines will result.

Hand Pyrites Smalls Burner

These were not now much used, because the labour entailed in their operation had been found to be too expensive. The Glover acid, however, produced with this type of burner was not nearly so discoloured and turbid as that produced by most mechanical pyrites smalls burners.

With hand-operated burners, whether for spent oxide or pyrites, it was possible so to arrange the construction as to ensure very effective insulation. With mechanical burners not only did the construction of the burners *per se* aid dissipation of the heat of combustion, but owing to the fact that it was invariably necessary to instal a deposition chamber as a means of arresting the dust created, further and appreciable quantities of heat were lost.

When dealing with spent oxide burners, the chief disability accompanying the use of mechanical burners is the creation and entrainment of dust. By the installation of a dust chamber the effects could be mitigated, but no apparatus had yet been devised which would give as clean a gas as that resulting from lump pyrites burners or the Malétra type of smalls burner. Even the partial elimination of the dust had its accompanying disadvantage, quite apart from the labour aspect, in that an appreciable loss of heat was entailed, which otherwise could be used to advantage in the Glover tower for concentration purposes. Where it was elected to use a Cottrell precipitator a complete elimination of the dust was hardly possible. Certainly an improved quality of Glover acid was secured, but at an expenditure which could not be other than an important consideration when contrasting the two methods of combustion.

The rate of combustion of zinc concentrates was the lowest of all the most commonly used sulphur materials, and the application of extraneous heat was necessary if satisfactory desulphurisation was to be attained. Many types of burner had been used for this purpose. The best known of these are the "Delplace," "Hegeler," and "Ridge." A burner recently designed by Monsieur Emile Bracq, of Ets. Bracq-Laurent, embodied many distinctive features. In design, it largely followed the Bracq-Laurent pyrites burner. The modifications which the zinc blende burner embodied, some of which might subsequently be applied to the pyrites burner, included the provision of a large circular central chamber, which admitted of air-cooling of the shaft. Of course, with the combustion of zinc blende, external heat had to be applied, and a suitable arrangement for the application of external heat was provided.

Proposed Protective Duty on Superphosphate

Why Export Trade is Disappearing

THE Committee appointed by the Board of Trade under the Safeguarding of Industries Act to consider the application of the Fertiliser Manufacturers' Association for a duty on imported superphosphate held its second meeting at the Board of Trade Offices, London, on Monday.

Fertiliser Manufacturers' Case

Mr. A. N. GRAY, commercial manager and joint secretary of the Fertiliser Manufacturers' Association, was the first witness. Considerable time was taken up in an endeavour to explain certain discrepancies between the figures of exports given to the Committee by the applicants and those to be found in the Board of Trade returns. Mr. Gray explained that his figures were compiled from the returns received regularly from the manufacturers in this country, which gave the amount of superphosphate as dispatched from the works. The Board of Trade figures were Customs figures, and that might account for some of the difference. This, coupled with the fact that the shipments to Northern Ireland and the Free State were not considered exports by the manufacturers, whereas in the case of the Board of Trade returns these deliveries were regarded as exports, might explain some of the difference, although even then the figures did not agree.

The discussion confirmed the evidence already given that the exports of superphosphate are now practically negligible, and Mr. Gray said he regarded the export market as gone beyond recall. There might be some hope of a revival of business in the Baltic when the Russian position had straightened out, but that did not appear probable at the moment, whilst there was always the possibility of business in the future with South America. One of the principal reasons why the export trade had gone was that the countries to which we used to export were now making much more largely for themselves than they did previously.

The CHAIRMAN asked how it was proposed to explain the steady decline in exports from 1910 to 1914, when post-war conditions did not apply.

Mr. GRAY said he could only put forward the same reason as he had already given for the post-war period—namely, that since 1910 foreign countries and the Colonies had developed their manufacture of superphosphate to such a degree that they were practically independent of outside supplies.

Sir HENRY REW (a member of the Committee) said that the figures for 1910 onwards showed that it would not have taken many years, in the ordinary way, after 1914 for the export trade to have disappeared entirely.

Mr. GRAY replied that that was the whole point—namely, that the trade in this country could not look to export for any help, the only hope being possible developments in the Baltic and South America.

Home Manufacture Statistics

Figures were then placed before the Committee of the home manufacture of superphosphate, showing a decline from 770,000 tons in 1913–14 to 532,098 tons in 1923–24, whilst between the same periods the imports had increased from 50,000 to 145,000 tons. These were given to the Committee at the previous sitting by Mr. Menzies, and Mr. Gray now produced the details of the manner in which the figures had been arrived at, adding that about one-fifth of the total consumption of superphosphate in the British Isles is in the Irish Free State.

In answer to Sir Henry Rew, witness said that one of the qualifications for membership of the Association was that a firm must possess a phosphate rock dissolving plant, and at the present moment the Association represented the whole of the active output of superphosphate in this country. He only knew of one firm with a phosphate rock plant which was outside the Association, but that firm was not producing at the present moment.

Coming to the question of prices, the following figures were given of the current selling prices in the different districts of the United Kingdom and Ireland, the figures representing merchants' selling prices in 4-ton lots f.o.r. in January, 1925:

	£	s.	d.	
London	2	18	9	per ton net.
Eastern Counties	2	19	6	" " "
Western Counties	3	2	6	" " "
Humber and Lincolnshire	2	16	3	(average of two prices)
Mersey District	3	5	0	
North of England	3	5	0	
Scotland	3	2	6	
Ireland (North)	3	0	0	
Ireland (Free State)	3	5	0	

Raw Materials

Dealing with raw materials, Mr. Gray explained how the raw materials required by the industry consists of phosphate rock and sulphuric acid derived mainly from pyrites, both of which are derived entirely from foreign sources. Phosphate rock is imported from the French North African Colonies, America and Oceania, a small quantity also being obtained from Belgium and France. Prices c.i.f. United Kingdom ports varied with the freight, but to a good port of destination, in cargo lots of 3,000 tons, the c.i.f. values might be quoted approximately as follows for the year 1913–14:—

North African Phosphate, 58/63 per cent., 21s. per ton, c.i.f.
North American Phosphate, 70 per cent., 28s.
Oceania phosphate, 80/85 per cent, 57s.
Belgian and French phosphate, 40/45 per cent., 20s.

As a result of the disturbance of commercial conditions occasioned by the war there had been some change in the

proportion of the total supplies to the United Kingdom derived from each of the above sources. High freight rates and other causes rendered it uneconomic to ship phosphate to this country from Oceania at the present time, and the United Kingdom was almost entirely dependent upon French North Africa and America to cover her needs. The prices now current for phosphate rock (January, 1925) were approximately :—

North African Phosphate, 58/63 per cent., 19s. 6d. per ton, c.i.f.
North American Phosphate, 70 per cent., 29s.
Belgian and French Phosphate, 45/50 per cent., 26s.

At the moment, the supply of phosphate rock was in excess of demand, hence the low prices. The French Government, however, was seeking to bring about a restriction of output of the French North African mines, and as part of the arrangement to supply French buyers with their requirements at lower prices than those now obtaining, whilst substantially increasing prices to buyers other than French. The American shippers, who are supplying phosphate below the cost of production, would undoubtedly seize any opportunity to increase prices, and as these were the only two important shippers of phosphate to this country at the present time, there was every reason to fear that the United Kingdom would shortly have to face a heavy increase in the cost of this important raw material. On the other hand French exporters of superphosphate to this country, already favoured by cheaper labour and lower taxation would, if the arrangement were carried out, possess the further advantage of even cheaper phosphate rock and thus be enabled to cut further into the superphosphate trade of the United Kingdom.

Another raw material mentioned was pyrites (for the production of sulphuric acid). A very large proportion of the pyrites consumed in the United Kingdom was supplied by Spain, the mines being financed mainly, however, with British capital. The balance of this country's supplies was imported from Norway. There were two classes of pyrites, cuprous and non-cuprous. In the case of the cuprous pyrites the buyer, for the manufacture of acid, acquired only the sulphur content of the ore, and was required to deliver back to the seller the cinders remaining after the sulphur had been burned out. With non-cuprous ore, in the majority of instances, the cinders remained the property of the buyer. The present price per unit of sulphur in 48 per cent. pyrites was between 5½d. and 6d. c.i.f. United Kingdom ports, or, say from 22s. to 24s. per ton, which compared with 4d. to 5d. per unit c.i.f. in 1913–14, or, say, 16s. to 20s. per ton.

Production Capacity

As to production capacity, a census taken by the Ministry of Munitions in 1917 showed that the total capacity of the United Kingdom for superphosphate manufacture was 1,150,000 tons per annum. A census taken to-day would show that there had been an increase in total capacity. Taking that figure as a basis, however, the percentage of production to total capacity in the year ending June, 1914, was 72·61 per cent. ; in the year ending June, 1923, 47·85 per cent. ; and in the year ending June, 1924, 45·92 per cent. The plants were well distributed over the British Isles, but, good as this distribution was, the extraordinary length of coast line these islands possessed, and the large number of small ports located thereon, laid the industry open to serious Continental competition.

The witness had obtained the rates of wages paid by constituent members of the Fertiliser Manufacturers' Association in seven towns in the British Isles in 1913 and 1924, which showed that the average rate per hour for unskilled labour in 1913 was 4·9d., and in 1924 12·4d., so that the rate in 1924 was 2½ times that paid in 1913.

The CHAIRMAN ascertained that a man worked less hours now than previously, and asked whether, in that case, he did not work better.

Mr. GRAY replied that he did not think that was the usual experience. The amount paid in property taxation by seven factories in towns already mentioned in 1913 was £741, as compared with £3,802 in 1924. The amounts paid in local rates by these factories in 1913 amounted to £4,437, and in 1924 to £9,825, the increase being due partly to the increase in rates and partly to increased assessments.

In reply to the Chairman, the witness said that in one of the seven cases mentioned, where the assessment was increased, these had been extensions. The cost per workman for insurance was now about 10d. or 11d. per week greater than in 1913. The present reduced output was one of the most serious difficulties with which the industry had to contend, for with only about 45 to 47½ per cent. of the production capacity occupied, the on-cost per ton of product was excessive. To some extent the reduction in output was represented by reduced exports, but the main difficulty was twofold, viz. :—

(1) Owing to cheaper labour, lower taxation. and depreciated exchange, foreign manufacturers were able to undersell home makers in the United Kingdom, and as a result, imports of superphosphate, which before the war were only about 45,000/50,000 tons per annum, had, during the past year (1923–1924), risen to 145,690 tons.

(2) The severe depression in British agriculture had resulted in a serious falling off in the home consumption of superphosphate, which, even after allowing for the increase in imports, was now about 140,000 tons less than in the last complete pre-war year.

Transport and Plant Maintenance

As to internal transport, the effect of the increase in the cost of transport by rail, as compared with 1913, was very considerable, and bore very harshly upon the superphosphate industry. His figures indicated that railway charges showed a very much larger percentage increase over pre-war than did either raw materials or finished product, and in an industry such as that of superphosphate, where the unit of sale was a ton, transport charges were a very serious item. The effect of the increased rail charges was to cause the buyer to feel that prices for superphosphate delivered to his station were too high, and there could be no doubt that this fact had had considerable influence in reducing consumption, because, compared with an advance of 16·5 per cent. in the price at makers' works, the cost to the farmer, delivered at his station, showed an increase of 21·33 per cent., comparing 1925 with 1913. But it was not only in restricting the demand from farmers that high carriage charges were adversely affecting superphosphate manufacturers. High railway charges made it more difficult for British manufacturers to compete with foreign producers. British manufacturers were also at a disadvantage with regard to overseas transport. In regard to freight rates on imported raw materials, the British manufacturer was, comparatively speaking, at a serious disadvantage, as he was called upon to pay higher rates than were demanded for ocean transport from the same ports of loading to Continental ports. The costs of discharging cargo, and of port, harbour and dock dues, pilotage, etc., at British ports was higher than at Continental ports.

With regard to the cost of maintenance of acid and superphosphate plants, this was exceptionally heavy, considerable annual expenditure in repairs and renewals being essential to maintain the factories in a reasonable state of efficiency. Information obtained from a London factory as to the comparative cost of repairs and renewals was to the effect that the total expenditure in this connection during 1913 was £3,861, as compared with £6,377 in 1924. An Aberdeen factory had returned the total cost for repairs and renewals in 1924 as £7,200 (approximate), the expenditure in 1913 being approximately £4,000.

Farmers' Objections

Mr. ALFRED ELLIS, cross-examining on behalf of the National Farmers' Union, referred to the prevailing depression in agriculture, and suggested that this depressed agricultural industry would suffer from any increase in the price of superphosphate, even though the duty were moderate.

The witness said that would be a natural corollary.

Mr. ELLIS also pointed out that agriculture could not apply for protection under the safeguarding of industries regulations,

Referring to the increase in the price of superphosphate. which it was said would not be beyond the maximum of 10s., Mr. Ellis said he understood that was based upon the prices of raw materials remaining at the present level, and upon wages remaining at the same rate as at present. He asked whether, if a duty were put on imported superphosphate, there would be a tendency for the prices of raw materials to increase ?

Mr. GRAY said his opinion was that the effect of this duty upon the price of raw materials would be very small, because the supply to-day was vastly in excess of the demand.

Mr. ELLIS said that if there were an increase of 10s. per ton on the price of superphosphate it would throw a burden upon

agriculture amounting to about one-third of a million pounds per annum.

Mr. GRAY agreed, assuming that the maximum increase was imposed.

Asked if the increase in the price of superphosphate would have a detrimental effect on employment in the agricultural industry, the witness said he did not think it would have the smallest effect. The manufacturers wanted the biggest possible output, and they would see that the increase in price would be as small as possible. He also did not think there would be a sympathetic rise in the price of other fertilisers as the result of the increase in the price of superphosphate.

Re-examined, the witness said that the amount of superphosphate used per acre for the better crops was 3½ cwts. Assuming the maximum increase in price was 10s. per ton, this would mean 6d. per cwt., the additional cost per acre, therefore, being 1s. 9d. He did not think it could reasonably be suggested that a maximum extra cost of 1s. 9d. per acre would have any effect upon employment in the agricultural industry.

The Committee adjourned until April 27.

Agriculturists' Opposition

THE Somerset County Council's Agricultural Committee has decided, on the motion of Lord Strachie, that the application of the Fertiliser Manufacturers' Association for a duty on imported superphosphates, inquired into by a Board of Trade Committee, should be opposed.

The Progress of the British Alkali Industry

Sir Max Muspratt's Review of Conditions

In view of the important developments which have taken place and others already in contemplation we publish below the text of Sir Max Muspratt's address from the chair at the annual meeting of the United Alkali Co. briefly reported last week.

I NEED hardly call your attention (Sir Max said in moving the adoption of the report and balance sheet) to the fact that we have somewhat altered the form in which the accounts are presented.

The alterations do not affect the final result, which I trust you do not find unsatisfactory, but a few words of explanation of the alterations are desirable.

Taxation

We have at length emerged from the quagmire of war taxation. Throughout the period of uncertainty full provision was made for maximum liability, with the gratifying result that we have a final balance to the credit of £60,000. As this becomes an addition to our 1924 profit, and is not likely to recur, we believe you will cordially endorse our allocation of £50,000 more than usual to reserve.

As it is probable that for a few years some degree of stability has been maintained in the form, if not in the rate, of taxation, the time seems opportune for adapting our accounts to modern methods of accountancy, consequently the figures referring to the dividends appear on the first page of the directors' report as gross figures, the income tax relating thereto being adjusted in the profit and loss account.

The company still has to pay income tax on reserves created out of profits, but deducts allowance for depreciation (wear and tear). The net taxation adjustment is not sufficiently large to necessitate its inclusion as a separate item.

These alterations make a detailed comparison of individual items with 1923 figures difficult.

Thus, while the gross profit is practically the same as in 1923, the balance of profit before charging debenture interest is £602,304, against £452,845 in 1923, an apparent improvement of £149,000, but allowing for the income-tax adjustments already referred to, and certain other adjustments, the actual trading profit is not quite so high as in 1923.

Increase in Trade

The board is pleased to report that following a fall in the cost of production, and to induce further business, the company made reductions in the prices of its manufactured products, amounting to a very large sum in the aggregate, and the return in increased trade has come even more quickly than could have been anticipated, and has fully justified the reductions so made.

The figures in the balance sheet are not so greatly affected, and a comparison of most items is possible. Debenture stock, including accrued interest, stands at £16,800 less. The bonds on the Sotiel Mines are about £3,000 less, in accordance with the system of redemption. Debts owing by the company are £52,000 down, but underwriting, accident insurance, and investment reserve accounts are up by about £6,000.

Reserves Reach £1,000,000

The reserve account now reaches a million by the addition of £150,000 for last year, but is distributed as before between general and depreciation accounts. The debenture redemption account now stands at £345,000. The profit and loss figures are not comparable for the reasons already explained.

Taking the assets side, additions to plant are over £200,000, to which I will refer later, and the sales of plant and amortisation of mines are £130,000. Overburden account is down by a further £3,400. Stocks are about the same in total, in spite of drastic writing down of certain products in which world competition is somewhat threatening.

Debts owing to the company are up by £78,000, owing to expanding business. Investments are also up by £27,000. As a result of various activities our cash at bankers and bills are reduced by £64,000.

More Plant to Cope with Developments

Surveying the main lines of our products, the alkali and chlorine branches have shown most gratifying expansion, and we have had to increase plant at a considerable rate and, of course, at a considerable cost.

Up to the present we have been able to finance these extensions without serious embarrassment of our cash position, but if this otherwise gratifying development continues we may have to utilise some of those facilities for raising fresh capital which, foreseeing this need, we proposed to our debenture holders and shareholders some time ago, and which they so wisely gave us. The matter is not at the moment pressing.

Economic Competition Not Feared

In sulphuric acid neither we nor our fellow-makers have recovered from the dislocation of the war. One great consuming industry, in which we are also largely interested—namely, the superphosphate industry—is hard hit by competition, as the result of depreciated exchanges on the one hand and agricultural depression on the other.

Our mines in Spain are also adversely affected by the reduced consumption of ore, but owing to the policy adopted by the board some three years ago of extracting the copper on the spot, the immediate effect is not serious.

In some products German competition is becoming rather pressing. In most cases we believe this is more or less temporary, and with more stabilised conditions in that country uneconomic competition is likely to be reduced to a minimum, and in economic competition we can hold our own.

In one product, saltcake, a novel process recently reported as brought to perfection by the Germans, and resulting in costs extraordinarily low, may have far-reaching results. Nevertheless, fortunately for us, saltcake is a by-product, with an alternative process for the main product. The ultimate method of dealing with the problem gives grave reason for thought, but does not cause us real anxiety.

Meeting a National Need

In order to have in this country a nucleus plant for nitric acid in time of need, without importing nitre from abroad, we have worked out in detail standardised plant for the conversion of ammonia into nitric acid. Though not actually new, it had not been fully worked out in this country. This acid is absolutely necessary for the dye and explosives industries.

In peace time the economical advantages of this process are not overwhelming, but its national importance is so great that we considered it our duty to put complete information

and working drawings at the disposal of the Government without charge or conditions.

Progress in Dyes

The dye industry, in which we have some direct interest and even greater indirect interest, has been subject to considerable public controversy during the past year. That real progress has been made in the last few years is undoubted, but, as I have previously stated, progress would have been greater had there been greater co-operation with the heavy chemical industry.

During recent months a friendlier feeling towards the suggestion of co-operation has been shown, and discussions to that end are in progress which should lead to considerable advantage to the dye makers and dye users, and ultimately to ourselves.

We have for several years, by research and experiment, been preparing for this opportunity, and dye experts who have seen our work and our programme have expressed most favourable opinions of our progress.

Cordial Relations with Employees

Our relations with our staff and workmen continue to be most friendly. A considerable increase of wages took place last July to meet the rise in the cost of living, and at Christmas a revision of salaries took place, based on meritorious service.

Mr. John Frant, our chief cashier for eighteen years, retired at the end of last year. He had had fifty-six years' association with the company and its predecessors, and has the good wishes of all of us for a long and happy period of retirement. Two of our higher officials, Mr. J. H. Smith and Mr. J. J. Latham, were entertained to dinner by the directors, the one on completing, the other on attaining, his fiftieth year of service. Both are still in the full vigour of active service. One of our workmen at Weston, John Darlington, has just retired after sixy-eight years of active service, and the event was suitably recognised.

Our pension and life insurance schemes are working smoothly and our sports field and athletic club are nearing completion. In these various ways we are maintaining a feeling of friendship and good fellowship, which does much to alleviate the causes of friction which from time to time are liable to spring up in industrial life. (Cheers.)

Dr. G. C. Clayton, M.P., in seconding, said that whilst some industries complained of low output and bad work, he could definitely say that their employees generally were doing excellent work for the company, such as could only be achieved when relations were happy. (Hear, hear.)

The resolution was adopted.

On the motion of the Chairman, seconded by Mr. J. A. E. Rayner, Mr. Horace Muspratt, O.B.E., Mr. C. Hewitson Nelson, and Mr. W. Windus were re-elected directors, and the appointment of Dr. J. T. Conroy and Mr. F. W. Bain as directors was confirmed.

The meeting closed with a cordial vote of thanks to the chairman and directors.

Alleged Improper Use of Letter

British Oxygen Co. Granted Injunction

MR. JUSTICE ROMER in the Chancery Division on Monday granted an injunction restraining Liquid Air, Ltd., from publishing a letter sent by the Lancashire district agent of the British Oxygen Co., Ltd., to Tanks and Drums, Ltd., of Bradford, giving a specially low quotation for the supply of oxygen, on the ground that it was an infringement of plaintiffs' copyright.

His lordship held that the letter was an " original literary work " within the meaning of the Copyright Act and that it was an unlawful act on the part of the defendants to make photographic copies of it, and send one to a London stockbroker, even though, they said, they did it to vindicate their character and to defend themselves against the attacks of the plaintiffs. He said there was naturally very keen rivalry between the parties, and the letter was handed to the defendants by Tanks and Drums, Ltd. It quoted 22s. 6d. per thousand cubic feet for the supply of oxygen on condition that they took no interest in the erection of oxygen gas-plant in Bradford; but if the offer was not accepted the price would be 40s. per thousand.

The injunction was granted, with costs, and an inquiry as to damages, but without delivery up of the letter.

Sale of Billingham Nitrogen Factory

Further Questions in Parliament

VARIOUS questions have been asked in the House of Commons concerning the sale of the Billingham factory.

Mr. GUINNESS (Secretary to the Treasury) (H. o. C., April 7) made a comprehensive reply. He said that on March 22, 1918, the Minister of Munitions received sanction to proceed with the erection of a factory at Billingham for the production on a large scale of nitrogen and hydrogen and for combining the nitrogen and hydrogen so obtained for the production of ammonium nitrate to the ultimate extent of 60,000 tons per annum. Owing to the shortage of labour and of building materials not much progress had been made with the actual building of the factory at the Armistice. Consideration was given to the scheme as a post-war measure, but it was found that owing to information which had been obtained since the Armistice, particularly in respect of chemical works in the German occupied area, the original scheme, if proceeded with, would have to be much modified. The matter was submitted to the Cabinet in October, 1919, with a recommendation that the property should be advertised for sale on the basis of the Government interests in the production of nitric acid for service explosives being safeguarded. On Cabinet approval being obtained the property was extensively advertised in the London, Provincial, and technical press. It was not stated in that advertisement that the information procured by the Government Commission to the German factory at Oppau would be included, but applicants were informed that further particulars would be supplied on application to the Ministry of Munitions. There were no suitable applicants other than Brunner, Mond and Co.

In the agreement with Brunner, Mond and Co. there was a proviso by which the Government undertook on completion of the purchase to give all available information in its possession as to processes, etc., to the purchasers. The contract was signed on April 22, 1920, by the then Minister of Munitions, Lord Inverforth, and by two directors on behalf of Brunner, Mond and Co. It was not in the public interest to disclose the terms of the agreement, nor was he prepared to depart from the usual practice of refusing to disclose the sale price of surplus Government property or stores. This rule had always been observed in view of the possibility of prejudicing the purchaser in the event of his wishing to resell. He might say, however, that, having regard to the circumstances, the price was, in his opinion, a satisfactory one, and there appeared no probability whatever of obtaining such a price from any other source.

The factory had neither been built nor equipped, but land had been acquired, roads made, and foundations laid, etc., and certain orders for plant, etc., given. The commitments for land, stores, plant, etc., amounted approximately to £1,000,000. The commission was sent to Oppau and other chemical factories by the Minister of Munitions. He could not ascertain after this lapse of time what the cost was. It was not in the public interest to disclose who were members of the Commission, whose report (a confidential document) was received in February, 1919. It was, as already stated, part of the contract that Brunner, Mond and Co. should have access to the report and such other information as was available to the Government, and in this connection he referred questioners to article 172 of the Versailles Treaty which provided that the German Government should disclose to the Allied and Associated Powers the nature and mode of manufacture for all such chemicals as were in question.

Fertiliser Restrictions in Queensland

EVERY dealer in fertilisers in Queensland is now required to obtain a licence and to forward to the Department of Agriculture, Brisbane, a certificate setting out the name of the fertiliser and the percentage of nitrogen, phosphoric acid, and potash, and their respective forms, and in the case of lime for fertilising purposes, the percentage of lime, carbonates, etc. Every wholesale dealer or producer of fertilisers is required to set out the name and address of the manufacturer, the raw materials from which the fertiliser is produced, the percentage by weight of each of such raw materials, and in the case of organic material the treatment, if any, that such organic material has been subjected to.

Chemical Federation

Dr. Armstrong's Views before the B.A.C.

Dr. E. F. Armstrong, President of the British Association of Chemists, addressed a meeting of the Birmingham Section of that body at Birmingham on Friday, April 3. There was a fairly good attendance, chemists being present from the Society of Chemical Industry, the Institute of Chemists, and the Chemical Society. Mr. A. W. Knapp, Chief Chemist at Cadbury's Works, Bournville, presided.

Dr. Armstrong spoke on "The Profession of Chemistry: What Can we Make of it?" There was need, he said, in this democratic age that chemists should take stock of their position, and he believed, when that was done, that it would be realised that an organisation fuller and with a broader scope than anything which now existed was necessary to provide for the various grades of men who might fairly be said to represent the profession of chemistry. He was strongly of opinion that there was no need for the present multiplicity of societies and organisations, each of which was supposed to represent some particular interest.

New Propaganda Methods

In view of the fact that there were a number of societies in the chemistry profession he would like to preach the philosophy of the "middle-way" among chemists. Their mission should be to make the nation understand what chemistry was, what it had done, and what it was doing. There was need for new propaganda methods; and in this connection he called attention to what was being done by the American Chemical Society which was an educational group for the purpose of encouraging a knowledge of chemistry in the so-called high schools of America. A substantial sum of money was given by a wealthy citizen as a memorial endowment; and the form of propaganda was the organisation of an essay competition on six subjects as showing what chemistry had done. The local section of the Society and prominent local persons acted as judges, scholarship prizes being given in each State of America in each of the six subjects. Moreover, 14,000 sets of five selected books, on the subject, were distributed to libraries, etc.; and it was calculated that 360,000 pupils read one or other of those books. It was calculated, too, that 500,000 school children in America became interested in the essay competition and did a certain amount of work in connection with it; 30,000 essays were sent in for adjudication. The result was that a very large number of persons became interested in the subject, and who would not have been interested but for the competition. Such interest must ultimately lead to a better appreciation of the work of the chemist; and his belief was that propaganda of this kind was worthy of their attention, individually, and of the attention of some of their chemical societies. Such a piece of work might be undertaken by the Institute of Chemistry, and the good resulting would be extraordinary.

Getting Together

Some of them had done their best to bring some of the societies, catering for the interests of various sections of chemists, together. Such a movement would only succeed when it came from the mass of the members. If it came from the bottom upwards, and there was insistence that the societies should combine, then chemistry would achieve something. What was wanted was a register of chemists and a central home for chemists in London to start with, and, later on, if they could get it, homes in provincial centres. A third ideal was that they ought to have one journal. Everybody who reached a certain attainment in chemistry ought to be registered as a chemist; that attainment could be measured in a number of ways. A man could pass examinations and obtain the honours degree; that could be taken in lieu of a professional examination. Thus they have a class on the register who were to-day known as Associates, which was not a very fortunate term. Then, they might select people of experience who had reached a certain position in the world, and, if thought well, they could be set on one side as Fellows as was done at present by the Institute. There was the remainder—the third class—who were just as good as those mentioned, who had not had time to pass examinations—a class who had been in the chemical industry and profession for years and who were entitled to be registered as chemists. "I think the British Association," observed Dr. Armstrong, "has found the way to discover those people." Educational facilities to-day were infinitely better than they used to be, and the third class might in course of years be expected to draw smaller and smaller. He did not see any difficulty in setting up a register of chemists; thus they would have one body qualified to speak for all chemists. The management of that body would probably present difficulties. One scheme might be that each class would have its own council or committee, and be represented on a basis proportional to the number of the members on a central council. Such a body would be a proper body to watch over the benevolent side of the chemical profession as well as over professional interests. If all chemists were in one big body like that one of the duties would be to promote the cause of chemistry. It would have its scientific group for promoting pure research as now represented by the Chemical Society. It would have its industrial group, holding meetings for the reading and discussion of papers on applied chemistry; thus they would be doing work now undertaken by the Society of Chemical Industry. Finally, there could be a third group, interested in the application of engineering to chemistry, a function which was partly filled by the so-called engineering group, and the so-called group of Chemical Engineers. Thus would these become groups of one body, which should be in a position to speak for all chemists on all occasion. (Applause.)

Mr. H. G. Shatwell (Birmingham University) observed that the chemistry profession suffered severely from lack of cohesion and co-ordination. One of the questions which was largely in their hands to-day was that of subscriptions. They were constantly told by men that they could not afford to join more societies. If a central society were formed with a number of sub-groups, then the question of headquarters' offices, etc. would be simplified; the staff required would be less; and in many ways, the cost of organisation would be considerably reduced. "We want not a closed profession," he added, "but a less open profession, and with that will come economic advantage."

Society of Public Analysts

At the ordinary meeting held at the Chemical Society's Room, Burlington House, on Wednesday, April 1, Mr. G. Rudd Thompson (president) in the chair. Certificates were read for the first time in favour of:—Messrs. Lewis Eynon, B.Sc. (Lond.), F.I.C., Jack Rowan Heather, Frederick George Hitchman, and William David Rogers, B.Sc. (Hons. Lond.), A.R.C.S., F.I.C. Certificates were read for the second time in favour of:—Messrs. George William Fraser Holroyd, M.A. (Oxon), F.I.C., Cecil Eric Keeley, Andrew Francis Macculloch, M.A., B.Sc. (Edin.), A.I.C., Frank Vegetus North Mitchell, Charles Henry Thomson, and Walter Peter Whitley, B.A. (Oxon.).

The following were elected members:—Messrs. Douglas James Talbot Bagnall, A.C.G.F.C., A.I.C., Reginald Henry Coysh, M.Sc., A.I.C., George Van Barneveld Gilmour, B.Sc., A.R.C.Sc.I., A.I.C., Percy May, D.Sc., F.I.C., John Parry, Wilfrid Smith, B.Sc., A.I.C., and Miss Winifred Wright, B.Sc., A.I.C.

Abstracts of Papers

The subject of "Proposed Standards for Lemon Cheese" was dealt with in a paper by G. D. Elsdon, B.Sc., F.I.C. The author had made an inquiry into the subject and come to the conclusion that this substance should consist substantially of butter, eggs, sugar and lemons. An examination of commercial recipes and samples showed that the article manufactured on the large scale was frequently of inferior quality and that preparations were on the market containing no eggs, no butter and little fat of any description and having from 30 to 50 per cent. of added water, the presence of which was masked by the addition of "British gum" and possibly gum tragacanth. The suggestion was made that this and similar preparations should be amenable to control and that it was undesirable that articles of varying composition should be presented to the public under the same description.

In a paper on "The Quantitative Estimation of Cotton, Linen and Wood Fibres in Paper Pulp," W. Dickson, F.I.C., described a new reaction for distinguishing between cotton and linen fibres. The reaction depends upon the different behaviour of the two fibres when they are stained with

ammoniacal silver nitrate and subsequently cleared with very dilute nitric acid. Cotton retains little or no silver while linen retains a sufficient proportion to make it very dark in colour under the microscope. When mixtures are viewed under a polarising microscope it is possible by turning the nicols, to cut out the cotton and make the linen appear, or cut out the linen and make the cotton appear. The latter state of affairs is seen when the field is polarised, the linen being so black as to be merged into the black background. The method is applied to the qualitative estimation of cotton, linen and wood fibres, in presence of one another in paper pulp.

Dr. Lander on Fuel Research

An Opinion on the Bergius Process

THE annual meeting of the Manchester section of the Society of Chemical Industry was held at the Textile Institute on Friday, April 3, Dr. H. Levinstein presiding.

There were six vacancies on the committee and 11 candidates. The following were elected: Messrs. E. Ardern, W. H. Brindley, T. Callan, J. A. R. Henderson, T. Horner, and Miss Rona Robinson. Mr. H. C. Clanahan was re-elected auditor and the election of a second auditor was left to the discretion of the Committee.

The CHAIRMAN announced that at the last meeting of the Committee Mr. L. Guy Radcliffe had been unanimously elected to be the Chairman of the Section for the ensuing two years.

The Hon. Sec. (Mr. A. McCulloch) read the official report of the proceedings of the Section for the past year, all of which have been recorded in the pages of THE CHEMICAL AGE. The Report was adopted unanimously. The ordinary monthly meeting of the section was then held.

Smokeless Fuel and Oil

A paper on "Smokeless Fuel and Oil," was read by Dr. Lander, director of Fuel Research in the Department of Scientific and Industrial Research.

Dr. LEVINSTEIN, in introducing Dr. Lander to the members, wished to draw attention to two recent achievements of the greatest importance which had been brought to a measurement of technical success. Firstly, there was the Bergius process for the hydrogenation of oils and of coals for the production of liquid fuel, about which they would probably hear something from Dr. Lander, while, secondly, there was the manufacture on a large scale by the Badische Anilin und Soda Fabrik of methyl alcohol and formaldehyde from water gas. Hitherto methyl alcohol and its oxidation product formaldehyde had only been obtained by the distillation of timber, of which we had no useful supplies in this country. The invention was, therefore, of importance from the British point of view. It was regrettable that the technical working out of this process, which demanded great perseverance and an enlightened direction, had been left, as had been so often the case in the past, to a powerful German dyestuff company to develop. He would not attempt to elaborate the moral, but only to point out the extreme interest from a scientific point of view of the production of formaldehyde from coal.

Dr. LANDER referred to the proposal made by the late Mr. Scott-Moncrieff in 1890 to carbonise coal, or to make a fuel which he hoped would be a better fuel than gas coke, by withdrawing gas coke from the ovens before it was properly carbonised. This was the germ of the low-temperature carbonisation process. Mention was also made of the "Coalite" patent of Mr. Thomas Parker, of Birmingham, in 1906, and to the investigations of the "Fisher" Commission in 1912 when the problem of providing oil fuel for the Navy was considered. This Commission eventually directed their attention to the more scientific use of the coal supplies of the country. Dr. Lander explained the work done at H.M. Fuel Research Station at East Greenwich. The Fuel Research Board was formed in 1917, though not as a wartime measure. The object was to encourage research work in the utilisation of fuels from all points of view. At one time during the war period there was only about a weeks' supply of oil in the country; numbers of tankers being sunk every week. The Board adopted two lines of research work. One was a survey, from the physical and chemical point of view, of all the coal seams in the country, and that line of investigation was still being steadily pursued and would take years to complete. The second line was to investigate the problems which had to be solved if any large proportion of coal burned in the raw state was to be replaced by other forms of fuel obtained by distillation or by any conceivable chemical process. Naturally, low-temperature carbonisation occupied a rather prominent place in the minds of all concerned with the elucidation of the problem. Although the subject had been before the public for a long time there were really very few technical data available, and these were so conflicting that it became necessary to determine, first of all, though it almost seemed absurd to say it, what were the products obtainable. Suppose gas works were put on one side, and the suggested method of carbonisation at 600° C. to 650° C. was adopted, what were the products obtainable, and what was the treatment that the coal had to be subjected to in order to obtain those products? Really, all that was known at that time was that more oil could be obtained by low-temperature carbonisation, and that a coke could be produced which would light easily but was usually so soft that it would not stand transport.

The Late Sir George Beilby's Work

Dr. Lander then referred to the experimental work of Sir George Beilby, carried out at the Mary Hill works of the Cassel Cyanide Co., in Glasgow, to the R. S. Richard process, and to the Maclaurin retort developed in Grangemouth. All this work, good as it was, was directed along certain very narrow lines from the national point of view. Subsequently, Sir George Beilby designed a set of retorts carbonising two or three hundredweights of coal at a time. He hoped to obtain thoroughly accurate data by their use. How the coal was heated; what the temperature gradient should be; how the coal should be heated up; what the maximum temperature should be; how long it should be held at that temperature; the optimum conditions for oil; the conditions which would give a robust smokeless fuel. It was necessary at the same time to develop some chemical assay method of doing the work on the smaller scale, and this was done upon the basis of the method used in the Scottish shale industry for many years. The method was an empirical one in which the conditions were, by careful experimentation over several years, adjusted to match the actual working conditions found in these particular horizontal retorts. The method had now been standardised.

Dr. Lander further dealt with the blending of coals. It was now quite easy to make a robust coke, capable of enduring transport, and easily ignitible.

The construction and method of operation of the Glover-West vertical retorts were dealt with, and the Sutcliffe system of using finely ground coal explained, together with the preheating of coal before treatment.

A number of lantern slides illustrating the various departments of the East Greenwich works were shown.

The Bergius Process

At the conclusion of his paper, Dr. Lander referred to the Bergius process. A great deal of interest was being taken in this matter. It was not quite correct to say that the Bergius process was a going concern in oil. The plant was extremely interesting. Everything was controlled in a separate room at a distance. As a matter of fact, the Bergius Co. were seeking for a cheaper raw material than oil. After all, some people said that the so-called hydrogenation of oil was simply pressure-cracking. There was a controversy as to whether it was hydrogenation at all, but there was not very much cracking of oil going on in the country at the present time, and there was none in Germany. Since it was not paying to run anything but straight-run petrol the plant was shut down. The capital cost of the plant was very great. The position now was that a British syndicate had acquired an option of the Bergius rights subject to certain tests and the whole process was being very carefully investigated in Germany. It was very interesting to see brown coal put into a sort of "bomb" together with a certain amount of coke-oven tar as the carrying medium. The manufacturers did not trouble to mix them intimately, but if they did the result would be a very thick crumbly kind of paste. Hydrogen was let into the bomb at 50 atmospheres and went up to 100. The material withdrawn was distilled and fractionated, and there certainly was a considerable lightening up of the material. Apparently no grit was formed, and about 3 per cent. of hydrogen was absorbed in the process.

Chemical Projects on the Continent

A German Methyl Alcohol Process

RESPONDING to the toast of "Science and Industry," at the annual dinner of the Institution of Engineers-in-Charge, held at the Holborn Restaurant, London, on Saturday, April 4, Dr. W. R. Ormandy referred to some interesting industrial developments on the Continent which science had made possible. Since the war, he said, we in this country had not kept up that regard for science which made itself so evident when the Government discovered that they could not do without the scientist and engineer. One of the developments which showed the manner in which science was progressing was a new process of manufacturing methyl alcohol in Germany. Methyl alcohol was quite an important material in the manufacture of dyes and of formaldehyde, and we in this country, using thousands of tons a year for these purposes, were dependent upon the wood distillers of America for supplies. We paid £50 or £60 for every ton of methyl alcohol that the Americans let us have, but the Germans had discovered that, by passing water gas over a catalyst at a high temperature and under high pressure, they could make methyl alcohol, and were producing in one works 6,000 tons a year at a price of less than £12 per ton. Thus, our manufacturers of dyes and formaldehyde, using a material at £50 per ton, were endeavouring to compete with a product made with material costing £12 a ton.

The trouble was that in this country manufacturers could not be induced to spend thousands of pounds a year for perhaps ten years in succession when their technical officers pointed to problems which, given time and money, they could solve. In Germany they realised that science was an asset to a country.

Converting Coal into Oil

Another factor which might alter the equilibrium of the industrial world was that they had succeeded in Germany in converting coal—lock, stock and barrel—into oil. They were putting coal into a retort, under pressure and heat, in the presence of hydrogen, and converting 93 per cent. of it into oil. That was not yet on a commercial basis, but it had gone so far that they were dealing with half a ton an hour, and in his opinion the technical difficulties still remaining to be solved would be solved. That would mean that the coal companies, which had been to some extent at the mercy of the oil companies, would come into their own again. There was no doubt that petroleum—petrol and heavy oils—were the fuels of the future; they were, at any rate, the fuels which, for purposes of defence and attack, were absolutely essential. This problem of converting coal into oil had received such attention in two nations in Europe that their Governments were keenly interested and had acquired the rights. Also, it was a tribute to the growing appreciation in Government circles in this country that the Scientific and Industrial Research Board were by no means behind their Continental neighbours in the attention they were paying to this very important development.

Scientists in this country had no reason to hide their heads. Some of the most fundamental laws of science had been discovered here, but we had failed because we had left Germany to develop them industrially. That was because those who controlled the money bags here were not sufficiently educated to realise that science paid, and that science and industry were indissoluble.

Dyestuffs Licences for March

THE following statement relating to applications for licences under the Dyestuffs (Import Regulation) Act, 1920, made during March has been furnished to the Board of Trade by the Dyestuffs Advisory Licensing Committee:—

The total number of applications received during the month was 511, of which 442 were from merchants or importers. To these should be added 28 cases outstanding on the 28th February, making a total for the month of 539. These were dealt with as follows:—Granted, 403 (of which 366 were dealt with within seven days of receipt); referred to British makers of similar products, 63 (of which 53 were dealt with within seven days of receipt); referred to Reparation Supplies available, 38 (all dealt with within two days of receipt); outstanding on March 31, 35. Of the total of 539 applications received, 457 or 85 per cent. were dealt with within seven days of receipt.

Professor Bone on Coal Research

Problems for the Organic Chemist

AT a meeting of the London Section of the Society of Chemical Industry on Monday, Professor W. A. Bone gave a lecture on "The Constitution of Coal." Dr. Bernard Dyer (Chairman of the Section) presided.

Professor Bone said there had been a great amount of research upon coal in recent years and there was a great army of investigators at work upon it. Where 10 years ago we spent only one penny in research, we now spent a pound, and the subject was not lacking either investigators or money to urge it forward. It could not be said, however, that very much of fundamental importance had been found out with regard to the chemical constitution of coal. Speaking as an organic chemist, we know very little more about it than we did 20 years ago and our present research was not making that progress which had been hoped for. He did not think the researchers were to blame, however, but the work must be done by chemists and preferably by organic chemists with a knowledge of the methods employed in organic chemical research.

Coming to the methods employed by himself in the chemical examination of coal, Professor Bone objected strongly to the terminology which had been adopted by certain workers in using the words vitrain, fusain, durain, and clarain to indicate the dull bands and bright bands and the material found between them. Although having no objection to the terms as such, he wished to remind them that they did not indicate the chemical constitution of coal. They were merely the microscopic easily-recognisable constituents in the coal, and it was quite a mistake to suppose that having said that coal consisted of these constituents in varying proportions we had in any way explained coal. It had been suggested that the cause of the coking properties of coal was vitrain, but personally he did not believe it and, indeed, he had the best possible reasons for disbelieving it.

Three Lines of Investigation

There were three main ways in which chemists could investigate coal: (1) thermal decomposition; (2) by the action of solvents; and (3) chemical attack by oxidation, hydrogenation and so on. From the results of various investigations he concluded that there were three different stages in the decomposition of coal. The first was that in which oxides of carbon and water were available; that was a low temperature change. Then, at a higher temperature, changes took place which were characterised by the evolution of methane and unsaturated hydrocarbons, whilst at a still higher temperature there were changes which produced the evolution of hydrogen.

Professor Bone then gave some account of work which he had in hand in an attempt to deal with the chemical constitution of coal and in order to ascertain the constituents that really account for the coking properties. He did not believe that pyridine acted merely as a solvent in the ordinary sense of the word, but that under prolonged action there was a great deal of de-polymerisation of the coal substance. Therefore he had given up the use of pyridine in dealing with coal and preferred to use, instead, benzene under a pressure of 500 or 700 atmospheres. Under these conditions there was no decomposition of the coal as would be indicated by any evolution of gas. There was no gas evolved during benzene extraction, and although there might be some slight change in the coal substance under these conditions, it did not involve any breaking down of the coal structure. At any rate, there was no gas.

French Market for Bichromates

FRANCE is a good market for bichromates, especially of sodium and potassium, according to an American Consul in Paris. The French Customs statistics do not classify these items separately, but give a general table of imports of chromates and bichromates of sodium and potassium, which for the past three years were as follows:

	1922.	1923.	1924.
Imports, metric tons ..	3,031	3,661	4,645
Value in francs	7,840,000	10,671,000	14,197,000

The imports of bichromate of potassium originated mainly in Great Britain.

Chemical Matters in Parliament

Home Grown Sugar Beet

Mr. E. Wood (House of Commons, March 27), in reply to a question, stated that according to information supplied by the factory companies the amount of white refined sugar produced from beet grown in Great Britain was 7,011 tons in 1922, 13,281 tons in 1923 and 23,761 tons in 1924.

Arsenic from Japan

Mr. Samuel (House of Commons, March 30) in reply to a question said that the quantity of white arsenic compounds imported into Great Britain and Northern Ireland, and registered as consigned from Japan, amounted to 51 tons in December, 1924; 104 tons in January, 1925; and 81 tons in February 1925. There were no imports of metallic arsenic during the months in question.

Proposed Vinegar Legislation

A Bill to prevent the sale of imitation vinegar has been presented by Mr. Hannon. It proposes that the following definitions shall have effect for the purposes of the Sale of Food and Drugs Act, 1875, and this Act: "Vinegar" is a liquid which comprises not less than four grammes of acetic acid in one hundred cubic centimetres of such liquid with or without the addition of caramel and harmless flavouring substances; it does not contain any sulphuric or other mineral acid. The acetic acid comprised in vinegar (other than the liquid described as "imitation vinegar") is derived wholly from alcoholic and subsequent acetous fermentations of saccharine materials. "Distilled vinegar" is vinegar which has been prepared by the distillation of vinegar. "Imitation vinegar" is any product made by the dilution of acetic acid or containing any acetic acid which is not the product of alcoholic and subsequent acetous fermentations of saccharine materials. It contains not less than four grammes of such acetic acid in every one hundred cubic centimetres of such product; it does not contain any sulphuric or other mineral acid. Imitation vinegar must be so labelled for sale.

British Celanese Factory Conditions

Mr. Oliver (House of Commons, April 6) asked the Home Secretary whether he would state, in specific terms, what steps have been taken by his Department to reduce the high rate of sickness among the operatives at the British Celanese Company, Spondon, arising from the use of acetone in the manufacture of artificial silk?

Sir W. Joynson-Hicks said that the matter was a highly technical one, and was still under investigation. The works were visited last week by one of the medical inspectors, who reported that a number of the cases of sickness which recently occurred there were cases of influenza, and that the effects of the acetone on the workers have not been so serious as represented. He stated, however, that the workers were being affected to some extent, and that some improvements were needed in the arrangements. One of the engineering inspectors would visit the works and advise as to the alterations required. As soon as his report was received further steps would be taken.

Arsenic Imports

Mr. Samuel (House of Commons, April 6), in reply to a question, gave the following available details of arsenic and arsenic compounds imported into Great Britain and Northern Ireland during the months specified. The actual countries of origin, as distinguished from countries from whence goods were consigned, were not recorded:—

Articles and Countries whence consigned.	Dec., 1924.	Jan., 1925.	Feb., 1925.
Arsenic (Metal).	lbs.	lbs.	lbs.
Germany	—	—	3,360
Arsenic, white.	Tons.	Tons.	Tons.
Belgium	10	30	37
France	—	—	10
Portugal	60	120	66
United States of America	10	10	—
Brazil	28	27	—
Other Arsenic Compounds.			
Netherlands	—	1	3
Belgium	6	5	5
France	31	—	—
Mexico	—	—	5

The Superphosphate Inquiry

Sir B. Chadwick (House of Commons, April 6), in reply to a question, said that no further statements would be made on this matter until the report of the inquiry was available.

White Lead in Paints

Mr. George Harvey (House of Commons, April 6) asked the Home Secretary whether the Government proposed to give effect, either in whole or in part, and to what extent, to the proposals of the Draft Convention of the International Labour Conference (Geneva, 1921) as to the use of white lead in painting buildings?

Sir W. Joynson-Hicks said that he was considering the introduction of a Bill to give effect to those proposals in the Draft Convention as to which there was general agreement, in order that the agreed regulations for the protection of the workers might be brought into operation as soon as possible.

Society of Chemical Industry

Annual Meeting of the Liverpool Section

THE annual meeting of the Liverpool Section of the Society of Chemical Industry was held in the Muspratt Lecture Theatre at the Liverpool University on Friday, April 3, Dr. J. T. Conroy presiding in the absence of Mr. Edwin Thompson.

Professor W. H. Roberts was elected chairman in succession to Mr. Edwin Thompson, who was elected to the vice-chair and thanked for his services during the past session; Dr. Alfred Holt was reappointed hon. treasurer, and Mr. E. Gabriel Jones hon. secretary; Messrs. R. B. Croad, W. M. W. Fell, H. E. Potts, and Dr. W. Tranton were appointed to the committee; and Mr. W. R. Sibbald was elected the representative on the Chemical Engineering Group.

The annual report presented by Mr. E. Gabriel Jones said that the attendance at the various meetings of the Section had been very good, with an average of fifty. As a result of the annual meeting in Liverpool two prize funds had been established with a sum of about £85, one of which would be competed for by the Liverpool Technical School, and the other was the fund given by Lord Leverhulme for the purpose which he had foreshadowed when making the gift. Reference was made to the necessity of members doing their utmost to obtain new members for the Society, as by increasing the membership the usefulness of the Society could be much enhanced. As the entrance fee had been suspended for 1925 the present time was particularly favourable for obtaining members, and the hope was expressed that all chemists and others engaged in chemical industry would eventually join the Society.

A Satisfactory Balance

In presenting the report of the hon. treasurer, Dr. Holt said they had spent about £70 during the past year, and he did not think the London Council would consider that very extravagant. There was a credit balance of £75 as a result of the year's working, and he thought that was satisfactory. The reports were adopted, and Dr. Holt and Mr. Gabriel Jones thanked for their services.

Colonel Bates, in moving a vote of thanks to the University authorities for the use of the rooms for their meetings, said the Section paid for the light used, but that barely covered the cost, therefore they practically had the use of the rooms without charge. Professor Roberts seconded the vote, which was carried.

Dr. Paul H. Prausnitz then gave an instructive exhibition and demonstration of the Jena glass-filter apparatus.

It had been intended that Dr. Holt should open a discussion on "Co-ordination of Chemical Organisations," but owing to the lateness of the hour this was deferred until the next meeting.

"Finisheen"

A NEW size, known as "Finisheen," is announced which, it is stated, can be used for all textiles, but has been manufactured with special regard to the winding, spooling, and weaving of artificial silk. An artistic booklet has been published fully describing this product and copies may be obtained by manufacturers and dyers of textiles from E. G. Sawyer and Co., of 110, Fenchurch Street, E.C.3, the sole concessionaires.

From Week to Week

MR. P. J. FRANKS, late secretary of the Briton Ferry Chemical Co., has joined the board.

WAGES IN THE GERMAN POTASH INDUSTRY have been increased by 7½ per cent. for ordinary time and 10 per cent. for overtime.

FIRE caused slight damage to a laboratory of the Silicate Paint Co., at Riverside, Charlton. Ether in contact with a light is stated to have been the cause.

FIRE WRECKED OVER 100 BUILDINGS belonging to the National Fireworks Company of America, at Hanover, Mass., on Tuesday. Many casualties are thought to have occurred.

MR. J. STANLEY LEWIS, A.I.C., read a paper on "Vapour Pressures of Binary and Ternary Fuel Mixtures" at the meeting of the Institution of Petroleum Technologists held in London on Tuesday.

FIRE DAMAGED the chemical works of Stainsby and Lyons, at Knottingley, Pontefract, on Sunday. Two of a range of thirteen tar distilling retorts burst and ignited. Large stocks of naphtha and benzol were on the premises.

REPORTS STATE that large works are to be erected shortly at Nottingham by Low Temperature Carbonisation, Ltd., at a cost of between £250,000 and £300,000. Retorts producing 2,000,000 cubic feet of gas per day will be laid down, and the residue will be converted into briquettes.

THE PRODUCTION OF SALT IN RUSSIA is increasing rapidly. In the first quarter of the current economic year 229,767 tons were produced, an increase of 80 per cent. on the previous year. The syndicated trusts produced 209,608 tons, or 90 per cent. of the total. Practically the whole production was disposed of, the leading consuming area being the Ukrain.

THE DEATH IS ANNOUNCED of Mr. Henry Ellison, principal and founder of Henry Ellison, Ltd., chemical manufacturers, of Cleckheaton, aged 78. He had also been a director of the Cleckheaton Chemical Co., the Sheffield Chemical Co., Ltd., and numerous gas undertakings, and had built up his own business from very small proportions to one of considerable importance.

SCIENTIFIC RESEARCH is receiving the active support of the Government, and among other schemes the Fuel Research Station at Greenwich is being extended. A research laboratory for forest products is being established at Princes Risborough at a cost of £12,000 and provision is being made for further extensions to the National Physical Laboratory and the Chemical Research Laboratory.

A PRESENTATION was made on Monday, March 30, to Mr. B. A. Burrell, who recently resigned the hon. secretaryship of the Yorkshire Section of the Society of Chemical Industry, after many years' service. It took the form of a gold cigarette case and a gold match box. Afterwards papers were contributed by Mr. G. F. Pickering on "Examination of Oxidation Products from Fatty Acids and Oleines" and "The Laboratory Examination of Soils," by Professor N. M. Comber.

AT A MEETING of the Institution of the Rubber Industry on Thursday, April 2, at Edinburgh, Mr. James Kirkwood, of the Ioco Rubber and Waterproofing Company, opened a discussion on "Some Difficulties in Mechanical Rubber Manufacture." Mr. Kirkwood said that the chief trouble experienced in the mechanical manufacturing of rubber might be divided into mixing, make-up, and vulcanising, and he emphasised the danger of scorching during mixing, and also spoke of the difficulties encountered in the calendering process.

APPLICATIONS ARE INVITED for the following vacant posts:—Bio-chemist at Dove Marine Laboratory, Cullercoats (apply the Registrar, Armstrong College, Newcastle-upon-Tyne); two assistant lectureships in physics in the University of Manchester (the Internal Registrar, by April 18); the professorship of bio-chemistry at Middlesex Hospital Medical School (the Academic Registrar, University of London, South Kensington, S.W., by April 23); the professorship of chemistry and directorship of the department of chemistry, University of Birmingham (the Secretary, by May 1); four scientific assistants for the science exhibition of the Royal Society at the British Empire Exhibition (the Secretary, B.E.E. Committee, Royal Society, Burlington House, London, W.1).

SIR MAX MUSPRATT, chairman of the United Alkali Co., left Liverpool for Spain on Wednesday, and will be away until about the middle of May.

THE EAST ANGLIAN CHEMICAL CO., LTD., is laying down plant for the production of potato fungicide and will soon be in a position to manufacture.

THE GERMAN FEDERAL POTASH COUNCIL has accepted the proposal of the Potash Syndicate for a 5 per cent. increase in home prices from April 16. Potash sales during March were estimated at 130,000 tons of K_2O.

THE MEETING of the executive council of the British Chemical and Dyestuffs Traders' Association, to be held in Manchester, on May 13, will be followed by a luncheon and general meeting open to members and their business friends. Mr. Victor Blayden will preside.

FUSION IN THE GERMAN ANILINE INDUSTRY is the subject of current rumours in Berlin. Efforts are being made to obtain a decrease of heavy stamp duties, which are said to be the reason of the delay in the amalgamations. The Stinnes group has increased its holdings in the Rogler Works Co., Dusseldorf.

AN INQUIRY by the Scottish Board of Health into the appeal of Mr. John Spencer, oil manufacturer, Aberdeen, against the withholding by the Town Council of sanction to establish a fish meal factory at Point Law, concluded on Saturday, April 4, at Aberdeen. After the evidence the Commissioner and the agents paid a visit to the Palmerston Road factory. The inquiry was adjourned to hear agents on a date to be fixed.

EDWARD ERNEST MUNRO PAYNE, 57, analytical chemist, of "Red House," Narborough, appeared at the last sitting of the Leicester Bankruptcy Court. His gross liabilities were £1,343 6s. 5d., and assets £1 19s. 7d. He said that he had been employed by a local tannery firm since 1905 at a salary of £10 a week. Under an agreement with the firm he was also paid certain commissions based on the turnover of the firm's business. The liabilities included arrears of income tax amounting to £509.

THE CAMBRIDGE UNIVERSITY PRESS of Fetter Lane, London, E.C.4, announce the publication of Volume XIX of the Royal Society's *Catalogue of Scientific Papers*, covering the letters T-Z during the years 1884-1900. This volume, the publication of which completes the great work of cataloguing the scientific papers of the nineteenth century, contains 46,811 entries of titles of papers by 7,992 authors, with the addition of anonymous papers, and brings the total number of entries for the period 1884-1900 to no less than 384,478, the authors numbering 68,577.

THE FOLLOWING DOCTORATES HAVE BEEN AWARDED by London University:—Ph.D. (Science), Mr. K. C. D. Hickman (Imperial College, Royal College of Science), for a thesis entitled "Studies in Adsorption, with special reference to the Washing of Photographic Products," and other papers, and Mr. D. F. Stedman (University College), for a thesis entitled "The Liquid-vapour Equilibrium of the System Glycerine-water"; D.Sc. (Physics), Mr. F. Simeon (University College), for a thesis entitled "1. The Carbon Arc Spectrum in the Extreme Ultra-violet; 2. Note on the Striking Potential necessary to produce a Persistent Arc in Vacuum," and other papers, and Mr. B. W. Clack (Birkbeck College), for a thesis entitled "On the Study of Diffusion in Liquids by an Optical Method."

AT THE ANNUAL GENERAL MEETING of the Birmingham and Midland Section of the Society of Chemical Industry, Mr. F. R. O'Shaughnessy, the senior vice-chairman and for many years the hon. secretary, wrote regretting his inability to accept the chairmanship owing to ill-health; and Dr. D. F. Twiss (chief chemist, Dunlop Rubber Co., Birmingham) was appointed in succession to Professor G. T. Morgan. The vice-chairmen appointed were Professor Morgan, Mr. W. A. S. Calder and Mr. W. T. Collis; and Mr. G. King was re-elected hon. secretary and treasurer. The following were elected to the committee:—Mr. W. A. Benton, Dr. Brownsdon, Professor A. R. Ling (Department of Bio-chemistry and Fermentation at the University of Birmingham), Mr. C. J. House, Mr. H. T. Pinnock, Mr. H. Silvester, and Mr. F. R. O'Shaughnessy.

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Patent Literature

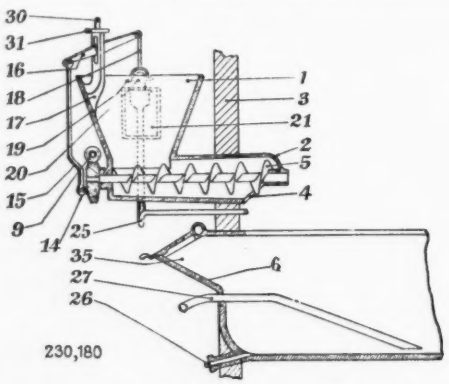
Abstracts of Complete Specifications

230,116. Anthraquinone Derivatives, Production of. E. G. Beckett, J. Thomas and Scottish Dyes, Ltd., Murrell Hill Works, Carlisle. Application date, September 3, 1923.

1-phthalimido-anthraquinone is nitrated and the product hydrolysed and subsequently reduced to obtain dyes or intermediates which may be acylated, *e.g.*, by benzoylation. In an example, 1-phthalimido-anthraquinone is dissolved in 97 per cent. sulphuric acid at 10° C. This solution is treated with a mixture of 80 per cent. nitric acid and 97 per cent. sulphuric acid. The mixture is finally poured into water, filtered, and washed. The nitrated product may be dissolved in 97 per cent. sulphuric acid, diluted, heated to 85° C., poured into water, boiled, filtered and dried. The crude hydrolysed body thus obtained may be purified by recrystallisation from nitrobenzene. This product may be reduced with sodium sulphide yielding a dye which gives purple shades on cellulose acetate. This product may be benzoylated by dissolving in boiling light pyridine and adding benzoyl chloride. The product dissolves in an alkaline hydrosulphide vat, and dyes cotton bluish-red shades. The starting substance, 1-phthalimido-anthraquinone, is described in specification No. 214,765. (See The Chemical Age, Vol X, p. 577.)

230,180. Acids, Manufacture of. C. Guadagni, 99, Corso Novara, Turin, Italy. Application date, December 6, 1923.

The apparatus is suitable for the manufacture of sulphuric acid by the lead chamber process, and also for the manufacture



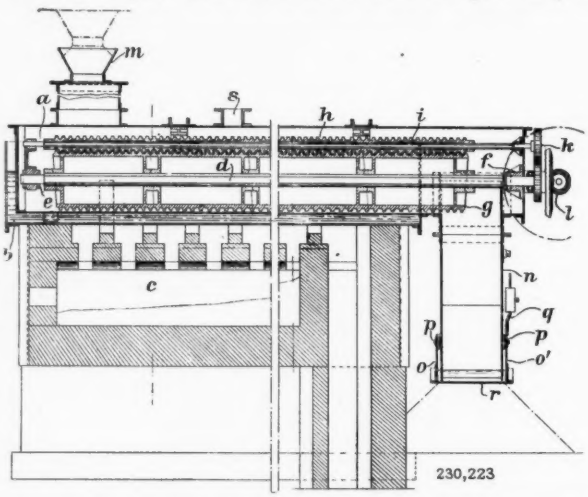
of hydrocholric acid, nitric acid, and bisulphate of soda. The apparatus is for feeding the reacting agents in the exact proportions necessary, and for discharging the end product. The hopper 1 is provided with a horizontal, slightly conical tube 2 entering the chamber 3. This tube is provided with a conveyor 5 driven by worm gearing 9. The worm wheel also reciprocates a rod 15 attached to a rocking lever 16, which is pivoted on a support 17. The opposite end of the rocking lever carries a scoop 20 operating in a tank 21. When the scoop is raised full of liquid, it is automatically tipped over so that the liquid is discharged into a funnel and thence into a tube 25. Below the outlet 4 is arranged the nitrate pot 6 projecting through the wall of the chamber 3. This vessel is provided with a tube 27, terminating near the bottom, for the automatic discharge of the bisulphate of soda. The distance of the mouth of the tube 27 from the bottom of the pot is arranged so that the bisulphate remains in the pot sufficiently long to eliminate all the oxides of nitrogen. The nitrate of soda is delivered in definite quantity from the hopper 1 by the screw conveyor 5, and at the same time the scoop 20 is dipped into the sulphuric acid in the tank 21 so that the exact quantity of acid necessary is also supplied to the pot 6. To compensate for variations in the strenth of the sulphuric acid the pivot of the lever 16 may be raised or lowered by mounting it on a screwed rod 30, so that the quantity of acid tipped from the scoop into the funnel may be varied. In a modified apparatus, more particularly suitable for the manufacture of hydrochloric acid, bisulphate of soda and nitric acid, the salt is supplied by a rotating valve distributor, and the sulphuric acid is supplied by means of two tanks, each having a syphon discharge and alternately filled and emptied by an automatic apparatus operated by the shaft of the automatic distributor.

230,217. Water Gas, Production of. G. E. Whitwell, P.O. Box, Tacoma, Washington, D.C., U.S.A. Application date, January 12, 1924.

In this process, part of the run is effected by passing a mixture of steam and gas successively through a recuperating or superheating vessel and the fuel bed in the regenerator, and another part of the run is effected by passing steam in the opposite direction through the fuel bed. The gas making run may be varied by passing at intervals steam through a recuperating or superheating vessel and generator successively, separating a part of the gas thus produced, and re-passing it with fresh steam through the recuperator or superheater and generator. In making carburetted water gas, the passage of steam and gas through the superheater, carburettor and generator in succession cleans the checker brickwork in the carburettor and superheater, and permits low grade oils to be used. Fuels other than coke and anthracite may be used in the generator.

230,223. Heat Treatment of Materials for Distilling, Drying or Carbonising Them. Thermal, Industrial, and Chemical (T.I.C.) Research Co., Ltd., Sir A. M. Duckham, D. Rider and J. S. Watts, 52, Grosvenor Gardens, London, S.W.1. Application date, January 17, 1924.

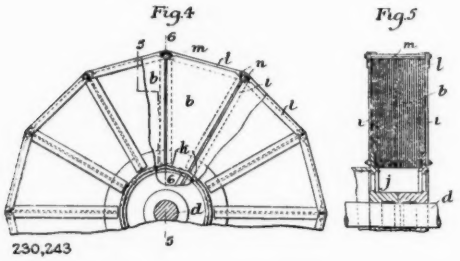
When a material is heated by causing it to travel through an externally heated retort by means of a stirring device, the transfer of heat due to the mixing of the heated particles and the cooler particles is very slow unless overheating of the particles in contact with the walls takes place. If this overheating is avoided by placing the retort in molten metal, the rate of travel must be very slow. In this invention, a trough-shaped retort *a* is arranged in a bath of molten lead *b* heated by a furnace *c*. A shaft *d* carries a screw threaded cylinder *g*, which meshes with another screw-threaded cylinder *h* carried by the shaft *i*, which is driven by the same gearing as the shaft *d*. The material to be treated, *e.g.*, pulverised shale, is fed through the hopper *m*, and the two screws ensure that it is distributed in a thin layer over the heating surface of the trough, so that heating is rapid. The thread of the screw *h* is preferably of



opposite hand to the thread of the screw *g*, and it exerts a grinding action on the material. The apparatus is applicable for the low temperature carbonisation of coal, and for the distillation of tar and oil. The residue is discharged into a shoot *n* closed at the bottom by a pivoted tray *r* containing water. This tray is periodically swung open to discharge the carbonised residue.

230,243. GAS WASHER-SCRUBBERS. Kirkham, Hulett and Chandler, Ltd., S. Hersey and F. W. Stokes, 37 and 38, Norfolk House, Norfolk Street, Strand, London, W.C.2. Application date, February 9, 1924.

The gas washer is of the kind in which a tank containing the washing water contains a series of parallel plates formed of built up bundles of sector shape, which are rotated in contact with the water. The framework for holding the bundles of plates *b* comprises **T**-section bars *i* extending radially in pairs from the driving hub, the periphery of which is formed with a



series of flats *k*. The lower or narrow ends of the plates in each bundle rest against the flats *k* and their side edges fit against the webs of the bars *i*. The bundles are held in position by **T**-shaped bars *m* secured by cross bolts *n* to the bars *i*. The framework is completed by circumferential bars *l*. The rigidity of the rotating members is increased, and wider bundles providing increased washing area can be used.

230,293. DECOLORISING CARBON, PROCESS AND APPARATUS FOR MANUFACTURING. J. N. A. Sauer, den Texstraat 2, Amsterdam, Holland. Application date, April 5, 1924.

The carbonising is effected in a vertical cylindrical retort of annular form, having an upper distilling zone 1, an activating zone 2, and a cooling zone 3. The material is fed from a hopper 4 at the top, and discharged into a valve box 5 at the bottom having a water seal 7. The annular retort surrounds a vertical duct 8 closed at the top near the upper part of the distilling zone 1. This duct has channels 9 leading to the activating zone, and channels 10 leading into an annular chamber 11. The outer wall of this chamber has ports 12 leading to vertical channel 13 opening at the top through valve 14 to the air. Another vertical channel 15 communicates with a steam pipe 16. The duct 8 has three ports at the bottom, one connected to a gas pipe 17, another to a pipe 18 leading to the channel 13, and the third to a pipe 19 leading to the channel 15. Thus combustible gas, air preheated in the channel 13, and steam superheated in the channel 15 can be passed into the duct 8, and pass out through the channels 9 into the annular retort chamber where the gas activates the material. The reaction gases pass into the chamber 11, in which they are burned with air entering through the ports 12. The combustion products flow upwards around the distilling zone 1, being guided by baffles 20. The upward extension of the chamber 11 has no outlet at the top except through ports 22 into the retort. The duct 23 communicates with a discharge pipe passing through the hopper 4. The distillation is effected partly by the external heating, and partly by the heat of the gases flowing through the upper part of the retort. Immediately below the distilling zone the charge is heated to a higher temperature without being traversed by the products of combustion or by activating gas. In the lower part of the retort the material is subjected to the action of steam and gas supplied through the duct 8 and passages 9. In some cases the reaction gases may not be burned in the chamber 11, the air supply to the ports 12 being cut off. In this case the gas may be burned in the upward extension of the chamber 11, to which air may be admitted. Various modified methods of conducting the distillation and activation may also be employed. The temperature in the activating zone may vary from 800° to 1200° C. The raw material may be wood or peat, and it may be mixed with substances such as calcium chloride, magnesium chloride, zinc chloride, carbonates, phosphates, alkaline earths, oxides, etc.

230,329 and 230,404. ALBUMEN DYESTUFF PRODUCTS OR COMPOUNDS, PRODUCTION OF. P. C. Rushen, London. From Haco-Ges. A. G. Bern, 4, Schanzenstrasse, Berne, Switzerland. Application date, November 30, 1923. 230,329 addition to 208,699.

230,329. It has been found that brominated and iodised compounds of albuminous bodies with a triphenyl methane auramine or safranine dyestuff can be obtained by treating the dyestuff with a salt of bromine or iodine. This introduction has been found to increase the bacteriological and antiseptic effects of these compounds. In an example, washed fresh yeast is heated with a solution of pyoctanine until the dye is fixed. Sodium iodide solution is then added, and the mixture boiled. By filtering, rinsing and drying, the iodide derivative of the leuco pyoctanine yeast compound is ozidised by the air. Other examples are also given.

230,404. In this process for the production of albumen dye compounds, the albuminous substance such as yeast is treated with methylene blue to reduce the dye and fix it in the form of its leuco compound. This compound may be treated with a salt of bromine or iodine to obtain the corresponding derivative, or alternatively the albuminous substance may be treated directly with an iodine or bromine derivative of methylene blue.

230,346. HYDROCYANIC ACID, PROCESS FOR THE MANUFACTURE OF A PRODUCT CONTAINING. Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler and O. Liebknecht, Weissfrauenstrasse 7-9, Frankfurt-on-Main, Germany. Application date, August 1, 1924.

The object is to enable liquid hydrocyanic acid to be transported and used without danger of poisoning, and this is effected by adsorbing the acid in adsorbents such as activated charcoal, silica gel, etc. The adsorbent may be treated with the acid in the liquid state, or the gas may be passed over the adsorbent. It is also found that hydrocyanic gas is selectively adsorbed from a mixture of gases. Activated charcoal can thus be charged with 50 per cent. of its weight of hydrocyanic acid. The adsorption is facilitated if the adsorbent is naturally acid or has been acidulated; also it is advantageous to treat the adsorbent with water. In this case, activated charcoal will take up 150 per cent. of its weight of hydrocyanic acid. The product is particularly suitable for use in cases where a very slow liberation of hydrocyanic acid is required.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—208,711-2 (Aluminum Co. of America) relating to electrolytic refining of metals, see Vol. X, p. 20 (Metallurgical Section); 214,261 and 223,192 (G. Lockemann) relating to manufacture of 1-phenyl-2 : 3-dimethyl-4-dimethylamino-5-pyrazolene, see Vols. X, p. 653, and XI, p. 630.

International Specifications not yet Accepted

228,512. ACTIVE CARBON. C. G. Schwalbe, 26, Donopstrasse, Eberswalde, Germany. International Convention date, January 30, 1924.

Waste sulphite cellulose lye is carbonised in the presence of a substance having a large surface area, such as adsorptive carbon, clay, or kieselguhr, with or without a small quantity of acid. In an example, the added substance may be the adsorptive carbon obtained by carbonising wood chips or bark with magnesium chloride solution. A small quantity of hydrochloric acid may be added to the sulphite cellulose lye, and the mixture heated to 180° C. at a pressure below 10 atmospheres. The products are water, methyl alcohol, and sulphur dioxide, while an absorptive carbon remains, some of which may be left for the treatment of a further quantity of lye.

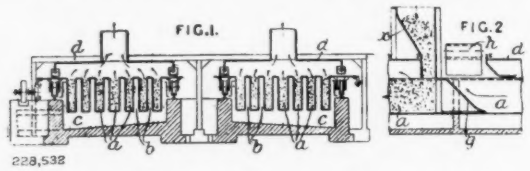
228,557. DYEING CELLULOSE ESTERS. Farbwerke vorm. Meister, Lucius and Brüning, Hoechst-on-Main, Germany. International Convention date, January, 29, 1924.

Monosulphonated 1 : 4-diamino-anthraquinone or 1 : 4-amino-oxyanthraquinone, or an alkyl, aralkyl, or aryl derivative having the sulpho group in 2- or 3-position are employed to give violet to blue shades on acetate silk. Examples of

dyes used include 1 : 4-diamino-anthraquinone-3-sulphonic acid, 1-oxy-4-aminoanthraquinone-2-sulphonic acid, 1-phenylamino-4-aminoanthraquinone-3-sulphonic acid and its 7-chlor derivative.

228,532. COKING KILNS. O. Dobbelstein, 2, Ruhrallee, Essen, and H. Hess, 48, Eschenstrasse, Duisburg, Germany. International Convention date, February 2, 1924.

A kiln for coking or treating coal, ore, bituminous slate etc., has a rotary annular hearth, in which the material is placed in deep grooves *a*. The heating gases circulate in the



space *b*. The material is fed from a hopper *x* to the kiln and is finally removed by ploughs *g* and delivered to a conveyor *h*. The casing *d* may have radial partitions so that distillates can be collected at different temperatures. The floor of the heating space *c* may be inclined from the centre outwards as shown. Alternatively, the hearth may be stationary, and the casing *d*, with the hopper and ploughs, may rotate.

LATEST NOTIFICATIONS.

231,417. Catalytic synthesis of ammonia. Dr. L. Casale. March 29, 1924.

231,446. Manufacture of new dyestuffs containing chromium. Soc. of Chemical Industry in Basle. March 28, 1924.

231,455. Process for producing fast tints or shades on acetylcellulose. Soc. of Chemical Industry in Basle. March 31, 1924.

231,468. Manufacture of borneols. Soc. Alsacienne de Produits Chimiques. March 28, 1924.

231,501. Process for the preparation of a clear and transparent infusible condensation product from phenol and formaldehyde. A. Danolowitsch and G. Petroff. March 25, 1924.

231,512. Manufacture of a new compound from diethylbarbituric acid and 4-dimethylamino-2-3-dimethyl-l-phenyl-5-pyrazolone. Dr. P. Pfeiffer. March 27, 1924.

231,529. Manufacture of azo-dyestuffs. Farbwerke vorm. Meister, Lucius and Brüning. March 29, 1924.

231,532. Manufacture of new dyestuffs of the anthraquinone series. Farbenfabriken vorm. F. Bayer and Co. March 31, 1924.

231,535. Manufacture of a Portland cement. H. Kühl. March 31, 1924.

231,536. Process of and apparatus for the production of sulphuric acid. Lodge-Cottrell, Ltd. March 31, 1924.

Specifications Accepted with Date of Application

206,121. Crude petroleum and other hydrocarbons, Processes for treating—to increase the yield of lighter products. G. Gane. October 26, 1922.

208,713-4. Electrolytic refining of aluminium and other metals. Aluminum Co. of America. December 21, 1922.

209,723. Azo-dyestuffs, Manufacture of. Soc. of Chemical Industry in Basle. January 9, 1923.

209,771. Mineral oils and the like, Method and apparatus for the fractional condensation of—in a series of column-like dephlegmators. K. Fuchs. January 13, 1923.

213,899. Solutions of solid materials, Preparation of—and apparatus therefor. F. B. Lomax. April 4, 1923.

228,195. Isopropyl allylbarbituric acid, Manufacture of. Farbwerke vorm. Meister, Lucius and Brüning. January 26, 1924.

230,877. Titanium salts, Production of preparations of. P. Spence and Sons, Ltd., H. Spence, W. B. Llewellyn, and S. F. W. Crundall. October 11, 1923.

230,910. Oxide of iron, Manufacture of. C. Monet. December 18, 1923.

230,916. Aluminium materials, Method for the extraction of. H. Wrigley. December 19, 1923.

230,920. Azo-dyestuffs, Manufacture of—and of intermediate products from which they are formed. British Synthetics, Ltd., and E. B. Higgins. December 19, 1923.

230,925. Tin and/or other ores, Process and apparatus for smelting. J. E. Evans-Jackson. (*M. Stroman.*) December 20, 1923.

230,958. Steel alloys. W. J. Talbot and Talbot-Stead Tube Co., Ltd. January 24, 1924.

230,968. Chlorhydroxytoluene, Manufacture of a nitro-derivative of. W. H. Webber, F. S. Brightmore and A. G. Bates. February 16, 1924.

231,018. Phospho-nitrogenous fertiliser. G. Garbin and S. Toniolo April 24, 1924.

231,021. Fertiliser. J. S. G. Telfer. May 3, 1924.

231,120. Albumen dyestuff products or compounds, Production of. P. C. Rushen (*Haco-Ges. Akt.-Ges.*). June 21, 1924. Addition to 230,404.

Applications for Patents

Austral Pigments, Ltd. Manufacture of ferric oxide. 8,710. April 1. (Australia, April 16, 1924.)

British Dyestuffs Corporation, Ltd., Ehrhardt, E. F., and Hereward, R. M. Manufacture of naphthylamine sulpho acids. 9,043. April 4.

Carbide and Carbon Chemicals Corporation, and Marks, E. C. R. Processes of making crotonaldehyde. 8,617. March 31.

Carbide and Carbon Chemicals Corporation. Solutions of cellulose esters. 8,933. April 3.

Chadburn, W. R., and De Laval Chadburn Co., Ltd. Centrifugal purification of mineral oils. 8,713. April 1.

Chadburn, W. R., and De Laval Chadburn Co., Ltd. Deaerating and degasifying liquids. 8,714. April 1.

Chadburn, W. R., and De Laval Chadburn Co., Ltd. Centrifugal separators. 8,715. April 1.

Chambers, C. F. M. Manufacture of casein, etc., products. 8,773. April 2.

Davidson, W. B., Michie, A. C., and Muddiman, E. W. Distillation of tar, etc. 8,716. April 1.

Durand et Huguenin Soc. Anon. Manufacture of products for dyeing or printing textile fibres, etc. 8,959. April 3. (Germany, April 4, 1924.)

Farbenfabriken vorm. F. Beyer and Co. Manufacture of dyestuffs. 8,598. March 31. (Germany, March 31, 1924.)

Farbenfabriken vorm. F. Beyer and Co. Manufacture of disazo dyes. 8,942. April 3. (Germany, April 4, 1924.)

Farbenfabriken vorm. F. Beyer and Co. Manufacture of ortho-acetoxy-para-methoxybenzoic acid. 8,943. April 3. (Germany, April 4, 1924.)

Farbwerke vorm. Meister, Lucius, and Brüning. Manufacture of azo-dyestuffs. 8,489. March 30. (Germany, March 29, 1924.)

Gawalowski, W. A. Production of pinene hydrochloride and synthetic camphor. 8,451. March 30.

Imray, O. Y., and Soc. of Chemical Industry in Basle. Manufacture of dyestuffs. 8,490. March 30.

Jackson, W. J. Mellersh-. (Soc. Anon. des Mines et Fonderies de Zinc de la Vieille-Montagne). Desulphuration of zinc ores. 8,754. April 1.

Kühl, H. Manufacture of cement. 8,631. March 31. (Germany, March 31, 1924.)

Lodge-Cottrell, Ltd. Production of sulphuric acid. 8,633. March 31. (Germany, March 31, 1924.)

Pfeiffer, P. Manufacture of CC-substituted compounds of barbituric acid and 4-dimethylamino-2-3-dimethyl-l-phenyl-5-pyrazolone. 8,944. April 3. (Austria, December 3, 1924.)

Sacharoff, L. S. Production of pinene hydrochloride and synthetic camphor. 8,451. March 30.

Salt Production Syndicate, Ltd., and Stephens, A. J. Extraction of salts from aqueous solutions. 8,724. April 1.

Scott, A. C., and Sulman, H. L. Explosives. 9,029. April 4.

Soc. Anon. des Mines et Fonderies de Zinc de la Vieille-Montagne. Desulphuration of zinc ores. 8,754. April 1.

Staudinger, H. Manufacture of esters of 4-oxy-piperidine. 8,748. April 1. (Switzerland, April 8, 1924.)

Staudinger, H. Manufacture of derivatives of 4-oxy-piperidine. 8,749. April 1. (Switzerland, April 8, 1924.)

Professor Morgan and Birmingham University

A CORRESPONDENT surveying the recent activities of the University in the *Birmingham Post* refers to the resignation of Professor Morgan. "Professor Morgan," he says, "has not been with us so long as Sir William Ashley, but he, too, has left his mark upon the University, especially upon the Faculty of Science. During the six years in which he has been at Edgbaston the research side of the chemistry department has multiplied itself sevenfold. It now contains some forty research students, and further extensions will be required if the department is to continue its existence even at its present strength. The new biology block will add materially to the general aspect of the University, besides affording very adequate accommodation to the departments of zoology, botany, and the bio-chemistry of fermentation. Yet another new building, intended to house the department of oil engineering, is actually in course of erection. A full-time professorship of bio-chemistry, a school of sugar, and an independent department of agriculture figure among the most prominent needs for the time being."

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at retailers' works.

General Heavy Chemicals

Acid Acetic, 40% Tech.—£21 to £23 per ton.
Acid Boric, Commercial.—Crystal, £45 per ton, Powder, £47 per ton.
Acid Hydrochloric.—3s. 9d. to 6s. per carboy d/d., according to purity, strength and locality.
Acid Nitric, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.
Acid Sulphuric.—Average National prices f.o r. makers' works. with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 65s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
Ammonia Alkali.—£6 15s. per ton f.o.r. Special terms for contracts.
Bleaching Powder.—Spot, £10 10s. d/d.; Contract, £10 d/d. 4 ton lots.
Bisulphite of Lime.—£7 10s. per ton, packages extra, returnable.
Borax, Commercial.—Crystal, £25 per ton. Powder, £26 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)
Calcium Chloride (Solid).—£5 12s. 6d. to £5 17s. 6d. per ton d/d, carriage paid.
Copper Sulphate.—£25 to £25 10s. per ton.
Methylated Spirit 64 O.P.—Industrial, 2s. 7d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.
Nickel Sulphate.—£38 per ton d/d. Normal business.
Nickel Ammonia Sulphate.—£38 per ton d/d. Normal business.
Potash Caustic.—£30 to £33 per ton.
Potassium Bichromate.—5d. per lb.
Potassium Chlorate.—2¾d. to 3d. per lb.
Salammoniac.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton. Carr. pd.
Salt Cake.—£3 15s. to £4 per ton d/d. In bulk.
Soda Caustic, Solid.—Spot lots delivered, £15 12s. 6d. to £18 per ton, according to strength; 20s. less for contracts.
Soda Crystals.—£5 to £5 5s. per ton ex railway depots or ports.
Sodium Acetate 97/98%.—£24 per ton.
Sodium Bicarbonate.—£10 10s. per ton, carr. paid.
Sodium Bichromate.—4d. per lb.
Sodium Bisulphite Powder 60/62%.—£16 to £17 per ton, according to quantity, f.o.b., 1-cwt. iron drums included.
Sodium Chlorate.—2¾d. per lb.
Sodium Nitrate refined 96%.—£13 5s. to £13 10s. per ton, ex Liverpool. Nominal.
Sodium Nitrite 100% basis.—£27 per ton d/d.
Sodium Sulphate (Glauber Salts).—£3 12s. 6d. per ton.
Sodium Sulphide conc. solid. 60/65.—About £15 per ton d/d. Contract £14 15s. Carr. pd.
Sodium Sulphide Crystals.—£9 5s. per ton d/d. Contract £9 2s. 6d. Carr. pd.
Sodium Sulphide, Pea Crystals.—£15 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

Acid Carbolic Crystals.—5d. per lb. Quiet demand. Crude 60's, 1s. 5d. to 1s. 7d. per gall. Little demand.
Acid Cresylic 97/99.—1s. 8d. to 2s. per gall. Rather more inquiry. Pale, 95%, 1s. 6d. to 1s. 10d. per gall. Dark, 1s. 6d. to 1s. 9d. per gall. Little demand.
Anthracene Paste 40%.—4d. per unit per cwt.—Nominal price. No business.
Anthracene Oil, Strained.—7d. to 8d. per gall. Unstrained, 6d. to 7d. per gall.
Benzol.—Crude 65's.—9d. to 11½d. per gall., ex works in tank wagons. Standard Motor, 1s. 4½d. to 1s. 6d. per gall., ex works in tank wagons. Pure, 1s. 9½d. to 1s. 11d. per gall., ex works in tank wagons. Supplies very scarce.
Toluol,—90%, 1s. 7d. per gall. More inquiry. Pure, 1s. 10d. to 2s. per gall. Steady demand.
Xylol Commercial.—2s. 3d. per gall. Pure, 3s. 3d. per gall.
Creosote.—Cresylic, 20/24%, 8½d. to 8¾d. per gall. Little demand. Middle Oil, Heavy, Standard specification, 6d. to 7d. per gall., according to quality and district. Market not quite so firm.
Naphtha.—Crude, 8d. to 9d. per gall. Solvent 90/160, 1s. 4d. to 1s. 6d. per gall. Demand good. Solvent 90/190, 11d. to 1s. 1d. per gall. Steady business.
Naphthalene Crude.—Cheaper in Yorkshire than in Lancashire. Drained Creosote Salts, £3 to £5 per ton. Steady but quiet. Whizzed or hot pressed, £6 to £9 per ton.
Naphthalene.—Crystals and Flaked, £12 to £15 per ton, according to districts.
Pitch.—Medium soft, 37s. 6d. to 42s. 6d. per ton, according to district. Not much business.
Pyridine.—90/160, 17s. 6d. to 18s. per gall. Market easier. Fair demand. Heavy, 11s. to 12s. per gall. Not much inquiry.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated.

Acetic Anhydride 95%.—1s. 7d. per lb.
Acid H.—3s. 9d. per lb. 100% basis d/d.
Acid Naphthionic.—2s. 2d. per lb. 100% basis d/d.
Acid Neville and Winther.—5s. 8d. per lb. 100% basis d/d.
Acid Salicylic, technical.—11½d. to 1s. per lb. Price reduced. Improved demand.
Acid Sulphanilic.—9d. per lb. 100% basis d/d.
Aluminium Chloride, anhydrous.—10d. per lb. d/d.
Aniline Oil.—7½d. per lb. naked at works.
Aniline Salts.—8d. per lb. naked at works
Antimony Pentachloride.—1s. per lb. d/d.
Benzidine Base.—3s. 8d. per lb. 100% basis d/d.
Benzyl Chloride 95%.—1s. 1d. per lb.
p-Chlorphenol.—4s. 3d. per lb. d/d.
p-Chloraniline.—3s. per lb. 100% basis.
o-Cresol 29/31° C.—3d. per lb. Demand quiet.
m-Cresol 98/100%.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
p-Cresol 32/34° C.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
Dichloraniline.—2s. 3d. per lb.
Dichloraniline S. Acid.—2s. 3d. per lb. 100% basis.
p-Dichlorbenzol.—£85 per ton.
Diethylaniline.—4s. 3d. per lb. d/d., packages extra, returnable.
Dimethylaniline.—2s. 2d. per lb. d/d. Drums extra.
Dinitrobenzene.—9d. per lb. naked at works.
Dinitrochlorbenzol.—£84 10s. per ton d/d.
Dinitrotoluene.—48/50° C. 8d. to 9d. per lb. naked at works. 66/68° C. 1s. per lb. naked at works.
Diphenylaniline.—2s. 10d. per lb. d/d.
G. Salt.—2s. 2d. per lb. 100% basis d/d.
Monochlorbenzol.—£63 per ton.
a-Naphthol.—2s. 3d. per lb. d/d.
B-Naphthol.—1s. per lb. d/d.
a-Naphthylamine.—1s. 3½d. per lb. d/d.
B-Naphthylamine.—3s. 9d. per lb. d/d.
m-Nitraniline.—4s. 2d. per lb. d/d.
p-Nitraniline.—2s. 2d. per lb. d/d.
Nitrobenzene.—5½d. to 5¾d. per lb. naked at works.
o-Nitrochlorbenzol.—2s. 3d. per lb. 100% basis d/d.
Nitronapthalene.—10d. per lb. d/d.
p-Nitrophenol.—1s. 9d. per lb. 100% basis d/d.
p-Nitro-*o*-amido-phenol.—4s. 6d. per lb. 100% basis.
m-Phenylene Diamine.—4s. per lb. d/d.
p-Phenylene Diamine.—9s. 9d per lb. 100% basis d/d.
R. Salt.—2s. 4d. per lb. 100% basis d/d.
Sodium Naphthionate.—2s. 2d. per lb. 100% basis d/d.
o-Toluidine.—10d. per lb.
p-Toluidine.—2s. 3d. per lb. naked at works.
m-Toluylene Diamine.—4s. per lb. d/d.

Wood Distillation roducts

Acetate of Lime.—Brown £11. Quiet market. Grey, £15 10s. per ton. Firmer. Liquor, 9d. per gall. 32° Tw.
Acetone.—£78 per ton.
Charcoal.—£7 5s. to £9 per ton, according to grade and locality. Fair demand.
Iron Liquor.—1s. 7d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.
Red Liquor.—10d. to 1s. per gall. 14/15° Tw.
Wood Creosote.—2s. 9d. per gall. Unrefined.
Wood Naphtha, Miscible.—4s. 9d. per gall. Only moderate market. 60% O.P. Solvent, 5s. per gall. 40% O.P.
Wood Tar.—£4 to £5 per ton. Demand slack and stocks being held.
Brown Sugar of Lead.—£43 10s. per ton.

Rubber Chemicals

Antimony Sulphide.—Golden, 7¼d. to 1s. 5d. per lb., according to quality. Crimson, 1s. 5d. to 1s. 7½d. per lb., according to quality
Arsenic Sulphide, Yellow.—2s. per lb.
Cadmium Sulphide.—4s. 4d. per lb., according to quantity.
Carbon Bisulphide.—£32 to £35 per ton, according to quantity.
Carbon Black.—6d. to 6½d. per lb., ex wharf.
Carbon Tetrachloride.—£62 to £67 per ton, according to quantity. drums extra.
Chromium Oxide, Green.—1s. 4d. per lb.
Indiarubber Substitutes, White and Dark.—5¾d. to 7¼d. per lb.
Lamp Black.—£48 per ton, barrels free.
Lead Hyposulphite.—9d. per lb.
Lithopone, 30%.—£22 10s per ton.
Mineral Rubber "Rubpron."—£16 to £18 per ton f.o.r. London.
Sulphur.—£10 to £12 per ton, according to quality.
Sulphur Chloride.—4d. per lb., carboys extra.
Sulphur Precip. B.P.—£56 to £65 per ton.

Thiocarbanillde.—2s. 6d. per lb.
Vermilion, Pale or Deep.—5s 6d. per lb. Dearer.
Zinc Sulphide.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

Acid, Acetic 80% B.P.—£42 per ton ex wharf London in glass containers.
Acid, Acetyl Salicylic.—2s. 9d. to 2s. 10d. per lb., according to quantity. Market slightly easier.
Acid, Benzoic B.P.—2s. to 2s. 3d. per lb., according to quantity, for synthetic product.
Acid, Boric B.P.—Crystal £51 per ton, Powder £55 per ton. Carriage paid any station in Great Britain.
Acid, Camphoric.—19s. to 21s. per lb.
Acid, Citric.—1s. 4½d. per lb., less 5% for ton lots. Slightly upward tendency.
Acid, Gallic.—2s. 9d. per lb. for pure crystal, in cwt. lots. Easier.
Acid, Pyrogallic, Crystals.—6s. per lb. for 1 cwt. lots. 7s. 6d. per lb. for 7-lb. lots according to quantity. Steady market.
Acid, Salicylic.—1s. 5½d. to 1s. 6d. per lb., according to quantity. Market rather easier.
Acid, Tannic B.P.—2s. 9d. per lb. Quiet steady demand.
Acid, Tartaric.—1s. 1d. per lb., less 5%. Very firm. Demand good.
Amidol.—9s. per lb., d/d.
Acetanilide.—1s. 9d. per lb. Price lower owing to competition.
Amidopyrin.—14s. per lb.
Ammonium Benzoate.—3s. to 3s. 6d. per lb., according to quantity.
Ammonium Carbonate B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.
Atropine Sulphate.—12s. 6d. per oz. for English make.
Barbitone.—11s. 9d. per lb. Price lower owing to competition.
Benzonaphthol.—4s. 3d. per lb. spot. Weaker. Demand quiet.
Bismuth Salts.—Prices reduced by about 1s. 3d. to 2s. 3d. per lb. on account of the fall in the price of the metal.
Bismuth Carbonate.—10s. 6d. to 12s. 6d. per lb.
Bismuth Citrate.—10s. 3d. to 12s. 3d. per lb.
Bismuth Salicylate.—9s. to 11s. per lb.
Bismuth Subnitrate.—8s. 8d. to 10s. 8d. per lb. according to quantity.
The price of Bismuth Metal has been raised from 5s. to 7s. 6d. per lb. Bismuth Salts have been advanced accordingly.
Borax B.P.—Crystal £29, Powder £30 per ton. Carriage paid any station in Great Britain.
Bromides.—Potassium, 1s. 7d. to 1s. 9d. per lb.; sodium, 1s. 8d. to 1s. 11d. per lb.; ammonium, 2s. to 2s. 3d. per lb. all spot. Upward tendency. Forward prices higher.
Calcium Lactate.—1s. 7d. to 1s. 9d., according to quantity. Fair demand and steady market.
Chloral Hydrate.—3s. 10d. per lb., duty paid.
Chloroform.—2s. 6d. per lb. for cwt. lots.
Creosote Carbonate.—6s. 9d. per lb. Little demand.
Formaldehyde.—£42 per ton, in barrels ex wharf.
Glycerophosphates.—Fair business passing. Calcium, soluble and citrate free, 7s. per lb.; iron, 8s. 9d. per lb.; magnesium, 9s. per lb.; potassium, 50%, 3s. 6d. per lb.; sodium, 50%, 2s. 6d. per lb.
Guaiacol Carbonate.—7s. 10d. to 8s. per lb.
Hexamine.—2s. 9d. per lb. for cwt. lots. For bold crystal.
Homatropine Hydrobromide.—25s. to 30s. per oz.
Hydrastine Hydrochloride.—English make offered at 120s. per oz.
Hydrogen Peroxide (12 vols.).—1s. 8d. per gallon for makers' works, naked.
Hydroquinone.—4s. 3d. per lb. Nominal.
Hypophosphites.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
Iron Ammonium Citrate B.P.—1s. 11d. to 2s. 3d. per lb.
Magnesium Carbonate.—Light Commercial, £36 per ton net. Light pure, £46 per ton.
Magnesium Oxide.—Light Commercial, £72 10s. per ton, less 2½%, price reduced; Heavy Commercial, £25 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.
Menthol.—A.B.R. recrystallised B.P., 43s. 6d. per lb.; April delivery. Synthetic 26s. to 35s. per lb., according to quality.
Mercurials.—Market very quiet. Mercury slightly firmer. Red oxide, 5s. 2d. to 5s. 4d. per lb.; Corrosive sublimate, 3s. 7d. to 3s. 9d. per lb.; white precipitate, 4s. 6d. to 4s. 8d. per lb.; Calomel, 3s. 10d. to 4s. per lb.
Methyl Salicylate.—1s. 7d. to 1s. 11d. per lb., according to quantity.
Methyl Sulphonal.—19s. 3d. per lb. Cheaper.
Metol.—11s. per lb. British make.
Morphine and Salts.—Reduced by 1s. to 1s. 3d. per oz.
Paraformaldehyde.—2s. 2d. for B.P. quality. Keen competition has brought prices down.
Paraldehyde.—1s. 2d. to 1s. 5d. per lb., in free bottles and cases.
Phenacetin.—4s. 9d. per lb. in cwt. lots. Unsettled. Supplies exceed demand.
Phenazone.—6s. 3d. to 6s. 6d. per lb. Spot price lower than forward.
Phenolphthalein.—4s. 6d. to 5s. per lb. for cwt. lots.
Potassium Bitartrate 99/100% (Cream of Tartar).—83s. per cwt., less 2½% for ton lots.
Potassium Citrate.—1s. 10d. to 2s. 2d. per lb.
Potassium Ferricyanide.—1s. 9d. per lb. Quiet.
Potassium Iodide.—16s. 8d. to 17s. 5d. per lb., according to quantity. Steady market.
Potassium Metabisulphite.—7½d. per lb., 1-cwt. kegs included. f.o.r. London.
Potassium Permanganate.—B.P. crystals, 7½d. per lb., spot; commercial, 8d. to 8½d. per lb., carriage paid. Slight reaction after recent advance.
Quinine Sulphate.—2s. 3d. to 2s. 4d. per oz., in 100 oz. tins. Steady market.
Resorcin.—4s. 9d. per lb. In fair quantities. Supplies exceed demand.
Saccharin.—63s. per lb. in 50-lb. lots.
Salol.—3s. 6d. per lb., for cwt. lots. Slightly dearer.
Silver Proteinate.—12s. per lb. for satisfactory product light in colour.
Sodium Benzoate, B.P.—1s. 10d. to 2s. 2d. per lb. From natural benzoic acid. Supplies of good quality available.
Sodium Citrate, B.P.C., 1923.—1s. 11d. to 2s. 2d. per lb., according to quantity.
Sodium Hyposulphite, Photographic.—£14 to £15 per ton, according to quantity, d/d consignee's station in 1-cwt. kegs.
Sodium Metabisulphite Crystals.—37s. 6d. to 60s. per cwt., net cash, according to quantity.
Sodium Nitroprusside.—16s. per lb.
Sodium Potassium Tartrate (Rochelle Salt).—75s. per cwt., for ton lots and upwards.
Sodium Salicylate. Powder, 2s. 2d. to 2s. 3d. per lb. Crystal, 2s. 3d. to 2s. 5d. per lb. Flake, 2s. 6d. per lb. Strong demand, market firmer.
Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb.
Sodium Sulphite, anhydrous, £27 10s. per ton, minimum 5 ton lots, according to quantity; 1 cwt. kegs included.
Sulphonal.—13s. per lb. accepted for quantity.
Thymol.—18s. per lb. Firmer.

Perfumery Chemicals

Acetophenone.—10s. 9d. per lb.
Aubepine.—11s. 3d. per lb.
Amyl Acetate.—3s. per lb.
Amyl Butyrate.—6s. 6d. per lb.
Amyl Salicylate.—3s. 1½d. per lb.
Anethol (M.P. 21/22° C.).—4s. 6d. per lb.
Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s. 7½d. per lb.
Benzyl Alcohol free from Chlorine.—2s. 7½d. per lb.
Benzaldehyde free from Chlorine.—3s. 1½d. per lb.
Benzyl Benzoate.—3s. 1½d. per lb.
Cinnamic Aldehyde Natural.—16s. per lb.
Coumarin.—16s. per lb.
Citronellol.—22s. per lb.
Citral.—10s. per lb.
Ethyl Cinnamate.—10s. per lb.
Ethyl Phthalate.—3s. per lb.
Eugenol.—10s. 6d. per lb.
Geraniol (Palmarosa).—28s. 6d. per lb.
Geraniol.—9s. 6d. to 26s. 6d. per lb.
Heliotropine.—6s. 3d. per lb.
Iso Eugenol.—15s. per lb.
Linalol ex Bois de Rose.—24s. 6d. per lb.
Linalyl Acetate.—24s. 6d. per lb.
Methyl Anthranilate.—10s. per lb.
Methyl Benzoate.—5s. per lb.
Musk Ambrette.—50s. per lb.
Musk Ketone.—42s. 6d. per lb.
Musk Xylol.—11s. per lb.
Nerolin.—4s. 6d. per lb.
Phenyl Ethyl Acetate.—15s. per lb.
Phenyl Ethyl Alcohol.—14s. per lb.
Rhodinol.—40s. per lb.
Safrol.—1s. 10d. per lb.
Terpineol.—2s. per lb.
Vanillin.—25s. to 25s. 6d. per lb.

Essential Oils

Almond Oil, Foreign S.P.A.—13s. 9d. per lb.
Anise Oil.—2s. 9d. per lb.
Bergamot Oil.—16s. per lb.
Bourbon Geranium Oil.—22s. 6d. per lb.
Camphor Oil.—62s. 6d. per cwt.
Cananga Oil, Java.—11s. per lb.
Cinnamon Oil, Leaf.—6d. per oz.
Cassia Oil, 80/85%.—10s. per lb.
Citronella Oil.—Java, 85/90%, 4s. 10d. per lb. Ceylon, 2s. 10d. to 3s. 1d. per lb., according to quality.
Clove Oil.—7s. 6d. per lb.
Eucalyptus Oil, 70/75%.—2s. per lb.
Lavender Oil.—French 38/40% Esters, 35s. per lb.
Lemon Oil.—3s. 9d. per lb.
Lemongrass Oil.—5s. 9d. per lb.
Orange Oil, Sweet.—11s. 3d. per lb.
Palma Rose Oil.—15s. 3d. per lb.
Otto of Rose Oil.—Bulgarian, 42s. 6d. per oz. Anatolian, 28s. per oz.
Palma Rosa Oil.—16s. 9d. per lb.
Peppermint Oil.—Wayne County, 65s. per lb. Japanese, 17s. 3d. per lb.
Petitgrain Oil.—9s. 9d. per lb.
Sandal Wood Oil.—Mysore, 26s. 7d. per lb. Australian, 18s. 6d. per lb.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, April 9, 1925.

DURING the past week business in heavy chemicals has been fairly satisfactory, and although quantities called for have not been large there has been plenty of inquiries for home and export trade.

Prices for Continental and home manufactured products are about the same level as last recorded.

Industrial Chemicals

ACID ACETIC.—In moderate demand and prices generally unchanged. 98/100% glacial, £56 to £67 per ton, according to quality and packing; 80% pure, £41 to £43 per ton; 80% technical, £40 to £42 per ton, packed in casks, delivered c.i.f. U.K. ports. Some spot parcels of 80% technical quality offered from the continent at slightly below the above figure.

ACID BORACIC.—Crystal or granulated at £45 per ton; powdered £47 per ton, carriage paid U.K. stations, minimum ton lots.

ACID CARBOLIC, ICE CRYSTALS.—Spot material unchanged at about 5¼d. per lb., delivered. Offered for forward delivery at a fraction less.

ACID CITRIC, B.P. CRYSTALS.—Unchanged at about 1s. 4½d. per lb., less 5% ex store, spot delivery. In usual steady demand.

ACID FORMIC, 85%.—Rather better inquiry. Now quoted £50 per ton, ex wharf, prompt delivery. Offered for early delivery at about £49 5s. per ton, ex wharf.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy ex works.

ACID NITRIC, 80°.—£23 18s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Quoted 3¾d. per lb., ex wharf, prompt shipment from the continent. Spot material unchanged at about 4d. per lb., ex store.

ACID SULPHURIC, 144°.—£3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Unchanged at about 11¾d. per lb., less 5% ex store.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Spot lots unchanged at about £7 5s. per ton, ex store. Offered from the continent for prompt shipment at about £6 12s. 6d. per ton, c.i.f. U.K. port.

ALUM, LUMP POTASH. Spot material unchanged at about £9 10s. per ton, ex store. Offered for prompt shipment from the continent at £8 7s. 6d., c.i.f. U.K. ports.

AMMONIA ANHYDROUS.—Rather cheaper quotations. Quoted 1s. 4½d. per lb., ex station. Containers extra and returnable

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered U.K. port.

AMMONIA LIQUID, 880.—In steady demand. Unchanged at 2½d. to 3d. per lb., delivered according to quantities. Containers extra.

AMMONIA MURIATE.—Grey galvaniser's crystals English manufacture, quoted at £29 per ton, ex store. Fine white crystals offered from the continent at about £20 10s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Spot material now obtainable at about £28 10s. per ton, ex store. Offered for forward delivery at slightly less.

POTASSIUM CHLORIDE, 98/100%.—Spot material of English manufacture quoted £10 10s. per ton, ex store. Foreign material on offer at about £9 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Spot lots quoted £10 10s. per ton, ex station. Contracts 20s. per ton less.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BORAX.—Unchanged. Granulated, £24 10s. per ton; crystals, £25 per ton; powdered, £26 per ton, carriage paid U.K. stations, minimum ton lots.

CALCIUM CHLORIDE.—English makers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, ex station. Continental quoted £3 15s. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 5s. per ton, ex works, packed in casks, free.

COPPER SULPHATE.—British material quoted £24 10s. per ton, f.o.b. U.K. port. Continental available at about £24 per ton, ex store. Offered from the continent at about £23 to £24 per ton, according to packages, c.i.f. U.K. port.

FORMALDEHYDE, 40%.—Nominally £43 per ton, ex store, but can probably be bought for less. Offered for early delivery at £40 per ton, ex wharf.

GLAUBER SALTS.—White crystals of English manufacture quoted £4 per ton, ex store or station. Continental on offer at about £3 10s. per ton, c.i.f. U.K. port.

LEAD, RED.—Imported material unchanged at about £43 per ton, ex store, spot delivery.

LEAD, WHITE.—On offer at £44 10s. per ton, ex store.

MAGNESITE CALCINED.—Quoted £8 per ton, ex station, prompt delivery.

MAGNESIUM CHLORIDE.—On offer from the continent at about £2 15s. per ton, c.i.f. U.K. ports.

POTASH CAUSTIC, 88/92%.—Unchanged at about £29 per ton, ex wharf, prompt shipment from the continent. Spot material available at about £30 10s. per ton, ex store.

POTASSIUM BICHROMATE.—Price for home consumption 5d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Quoted £25 5s. per ton, c.i.f. U.K. ports, prompt shipment. Spot material available at about £25 15s. per ton, ex store.

POTASSIUM CHLORATE.—Still scarce, but some spot parcels available at about 3½d. per lb., c.i.f. U.K. ports.

POTASSIUM NITRATE (SALTPETRE).—Refined granulated 99%, quoted £24 10s. per ton, c.i.f. U.K. ports. Spot material available at about £28 per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 7¾d. per lb., ex store. Offered for early delivery at 7½d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Now quoted at 7½d. per lb., ex store, spot delivery.

SODA CAUSTIC.—76/77%, £18 per ton; 70/72%, £16 12s. 6d. per ton. Broken, 60%, £17 2s. 6d. per ton. Powdered, 98/99%, £21 7s. 6d. per ton. All carriage paid U.K. stations, spot delivery. Contracts, 20s. per ton less.

SODIUM ACETATE.—On offer from the continent at about £19 10s. per ton, c.i.f. U.K. ports. Spot material quoted £21 10s. per ton, ex store.

SODIUM BICARBONATE.—Refined re-crystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Price for home consumption, 4d. per lb. delivered.

SODIUM CARBONATE.—(Soda crystals), £5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, £1 7s. 6d. per ton more. (Alkali, 58%), £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—English material unchanged at £9 15s. per ton, ex station. Continental quoted £8 10s. per ton c.i.f. U.K. ports. Spot material of continental manufacture available at about £9 15s. per ton, ex store. Pea crystals of English manufacture unchanged, at £14 per ton, ex station.

SODIUM NITRATE.—Ordinary quality quoted £13 7s. 6d. per ton, ex store; 96/98%, refined quality, 7s. 6d. per ton extra.

SODIUM NITRATE, 100%.—Offered from the continent at about £23 per ton c.i.f. U.K. ports. Spot material available at about £24 15s. per ton, ex store.

SODIUM PRUSSIATE, YELLOW.—Quoted 4¼d. per lb., ex store. In moderate demand for export.

SODIUM SULPHATE, SALTCAKE.—Price for home consumption, £3 10s. per ton f.o.b. works. Good enquiry for export and higher prices obtainable.

SODIUM SULPHIDE.—English manufacturers quote: 60/62% solid, £15 per ton; broken, £1 per ton more; flake, £2 per ton more. Crystals, 31/34%, £9 5s., per ton carriage paid U.K. stations. Minimum, 4 ton lots, with slight reduction for contract over a period. Continental material slightly cheaper 60/62%, solid, offered at about £11 per ton c.i.f. U.K. port; broken, £12 per ton c.i.f. U.K. port; 30/32%, crystals, £8 5s. per ton c.i.f. U.K. port.

SULPHUR.—Flowers, £9 10s. per ton; roll, £8 10s. per ton; rock, £8 7s. 6d. per ton; ground, £8 5s. per ton—ex store, prices nominal. American crude sulphur on offer at about £5 2s. 6d. per ton c.i.f. U.K. port.

ZINC CHLORIDE, 97/98%, of continental manufacture, quoted £23 per ton c.i.f. U.K. port. English material for export on offer at about £25 to £26 per ton f.o.b. U.K. port.

ZINC SULPHATE.—Rather better inquiry. Price now about £12 10s. per ton, ex store.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHYLAMINE.—Small inquiries. Price 1s. 7d. per lb.

SULPHANILIC ACID.—Small inquiries. Price 9d. per lb.

BETA NAPHTHOL.—Fair home inquiries. Price 11d. to 1s. per lb.

H. ACID.—Some home inquiries. Price 3s. 8d. per lb.

NAPHTHIONATE OF SODA.—Some home inquiries. Price 2s. 2d. per lb.

The Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, April 9, 1925.

The approaching Easter break has not been without its influence on the chemical market here this week, although notwithstanding this and the general industrial inactivity a moderate amount of business has been done, as before, principally in small parcels. Home buyers for industrial consumption are not taking anything like normal quantities. On the export side a fair number of inquiries are reported; actual business is largely on Colonial account. Values generally keep up pretty well, and in few instances can much falling away compared with last week's figures be reported.

Heavy Chemicals

Soda crystals are selling in fair quantities and price is steady at £5 5s. per ton. Phosphate of soda is quoted at round £12 15s. per ton, and business is rather slow. Caustic soda meets with a quietly steady demand, and quotations are well maintained at from £15 12s. 6d. per ton for 60 per cent. material to £18 for 76-77 per cent. Saltcake continues to move very slowly at about £4 per ton, while glauber salts are quiet but without change in value at from £3 10s. to £3 12s. 6d. per ton. Bicarbonate of soda is still offering at £10 10s. per ton, and a fair volume of trade is being put through. Sulphide of sodium arouses rather limited buying interest; 60-65 per cent. concentrated solid is quoted at £13 15s. to £14 per ton and crystals at round £9 10s. Hyposulphite of soda is quiet and easy at £13 10s. per ton for photographic crystals and £9 5s. for commercial quality. Prussiate of soda meets with a moderate demand, with the recent value of 4d. per lb. maintained. Acetate of soda continues to be offered at about £20 per ton, but sales are slow. There is no change in chlorate of soda, which is quoted at round 2⅝d. per lb. Alkali is firm and in fairly good request for home consumption and also for shipment; value is about £6 15s. per ton. Bleaching powder is steady and in quiet demand at £9 10s. per ton. Bichromate is attracting only a limited amount of attention, but values are maintained at about 4d. per lb.

Among potash compounds caustic is still quoted at between £29 and £30 per ton, but sales are comparatively slow. Carbonate of potash is in quietly steady inquiry with quotations maintained round £24 10s. per ton. Bichromate of potash is in moderate request at the unchanged price of 5d. per lb. Prussiate of potash is still selling in small quantities at about 7d. per lb. Permanganate of potash is steady at from 6¾d. per lb. for commercial to 7½d. for B.P. quality. Chlorate of potash keeps steady though rather quiet at 2¾d. per lb.

The demand for sulphate of copper is much below normal, although current quotations are still given as £24 10s. per ton. Arsenic is a very dull section of the market and prices keep weak in consequence; white powdered, Cornish makes, is now quoted at about £29 per ton in Manchester. Acetate of lead is again easier at £45 per ton for white and about £41 10s. for brown material. Nitrate of lead is quiet at £41 10s. per ton. Acetate of lime is rather inactive at £14 10s. to £15 per ton for grey and £9 15s. for brown. Commercial Epsom salts meet with a moderate inquiry and prices are steady at £4 15s. per ton, with magnesium sulphate, B.P. quality, on offer at £6 5s.

Acids and Tar Products

The demand for tartaric and citric acids is rather quiet, but quotations are about the same as at last report. Tartaric is quoted at round 1s. per lb. and citric at 1s. 4¼d. per lb. Oxalic acid has maintained its recent slight improvement, and values are steady at 3¾d. to 4d. per lb. Acetic acid is in moderate inquiry at round £40 per ton for 80 per cent. commercial and £67 to £68 for glacial.

Among coal-tar products pitch continues inactive at about 40s. per ton, though this price is more or less nominal. Solvent naphtha is steady at 1s. 5½d. to 1s. 6d. per gallon. Naphthalenes are easy at about £15 per ton for refined and from £4 15s. per ton for crude. Carbolic acid crystals are still offering at 5d. to 5½d. per lb. and crude at about 1s. 7d. per gallon.

London Chemical Market

Prices and conditions on the London Chemical Market are generally about the same as those published in The Chemical Age last week. Owing to Easter week business is on moderate and uninteresting lines.

Latest Oil Prices

London.—Linseed Oil easy and about 25s. decline. Spot, £44 10s.; April and May-August, £43 10s.; September-December, £42 10s. Rape Oil quiet. Crude crushed, spot, £48; technical refined, £51. Cotton Oil quiet. Refined common edible, £45; Egyptian crude, £39 10s.; deodorised, £47. Turpentine quieter and 3d. per cwt. lower. American, spot, 64s. 6d.; May, 64s. 9d. paid and sellers.

Hull.—Linseed Oil, naked, spot, £44 15s.; April and May-August, £44 10s.; September-December, £43 10s. Cotton Oil, naked Bombay crude, £36 10s.; Egyptian crude, £38 5s.; edible refined, £41 10s.; deodorised, £44; technical, £39 15s. Palm Kernel Oil, crushed, naked, £40 10s. Groundnut Oil, crushed/extracted, £47; deodorised, £51. Soya Oil, extracted, £38; crushed, £38 10s.; deodorised, £48. Rape Oil, extracted, £47 per ton, net, cash terms ex mill. Cod Oil, spot, 33s. to 34s. per cwt., barrels. Castor Oil unaltered.

Nitrogen Products Market

Export.—During the last week the export position has remained unchanged, producers disposing of available quantities at £13 10s. per ton f.o.b. It is not anticipated that there will be any change in this price between now and the end of May. Practically the whole of the sales made for prompt delivery are for continental consumption. Recently there has been very little business for forward delivery, and this has been transacted at about £13 per ton f.o.b. It is anticipated that when the season ends on May 31st, there will be a slight fall in export prices.

Home Trade.—The home demand continues to be brisk and producers are disposing of 500-600 tons per day. The demand is regular from all parts of the country, and during the last week large sales have been made for consumption in Northern Ireland.

The home price, £14 14s. per ton delivered to consumer's nearest station, for neutral quality, basis 21·1 per cent. nitrogen, will remain unchanged until May 31. The small quantity of ordinary quality now available has been disposed of for delivery up to the end of April in almost all districts.

Nitrate of Soda.—The nitrate of soda market has been slightly firmer during the last week due to large purchases made in America, mostly by the cotton growers. Cargoes can be purchased for prompt delivery at £11 14s.-£11 16s. per ton. It is still expected that the Producers' Association will commence next season with a much lower scale of prices.

American Market Movements

(From *Drug and Chemical Markets.*)

General list of industrial chemicals continues in firm condition. Spot buying dull and contract movements heavy. Barium chloride sold-up abroad. Carbon tetrachloride very firm.

Demand for dyes and intermediates remains quiet. Prices steady. Benzene easier on gasoline cut. Other light oils strong. Commercial xylene scarce.

Fine chemicals remain in fair demand only. Citric acid lower. Imported bromides stronger. Camphor, cod-liver oil, and Rochelle salts higher. Thymol lower.

Oxalic Acid from Rice

Oxalic acid from rice is stated to be the result of a new process developed in America. The import duty on oxalic acid has recently been from 4 to 6 cents per lb., and Perfect Products Co., of Huntsville, Georgia, are said to be working the new process by means of the oxidation of rice by nitric acid.

Company News

THOMAS FIRTH AND SONS.—The directors have decided that it is inadvisable to make any distribution of profits for the year on the ordinary shares.

ANTON JURGENS UNITED MARGARINE WORKS.—The directors propose to pay the usual 6 per cent. dividend on the preference shares and no dividend on the common shares.

NEW TAMARUGAL NITRATE CO., LTD.—At the general meeting of shareholders held in Valparaiso on April 1, a dividend of 25 per cent. was approved, payable on April 3.

WM. GOSSAGE AND SONS.—After providing for all charges the balance at the credit of profit and loss for the year ended November 30 amounts to £174,544, and has been appropriated as follows: Dividend on 5 per cent. first cumulative preference shares, £22,500; on 6½ per cent. cumulative preference shares, £48,750; and on the ordinary shares at 20 per cent., £100,000; leaving to be carried forward, £3,293.

THARSIS SULPHUR AND COPPER CO.—The net profit of the Tharsis Sulphur and Copper Company for 1924 amounted to £97,950 (against £97,173 in 1923), and with £30,225 brought forward there is a balance available of £128,175. The dividend proposed is again 10 per cent., less tax, absorbing £96,875 and leaving £31,300 to be carried forward. The gross profit declined from £181,320 to £159,561, but the amount written off properties (£18,804) was £8,682 lower, while expenses, taxes, etc., were £13,854 lower at £42,807.

NITRATE RAILWAYS CO., LTD.—The directors recommend that, subject to final audit of the accounts, the following dividends be declared, less income tax: A final dividend of 6 per cent., *i.e.*, 12s. per share, on the ordinary (unconverted) shares, making a total dividend for the year 1924 of 10 per cent.; a final dividend of 3 per cent., *i.e.*, 6s. per share, on the preferred converted ordinary shares, making a total and maximum dividend for the year 1924 of 7 per cent., and a dividend of 6s. per share on the deferred converted ordinary shares, being 3 per cent. for the year 1924.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

VARNISHES AND ENAMELS.—The South African Railways and Harbours are calling for tenders for the supply of varnishes and free-flowing enamels. Tenders will be received in South Africa until May 18. (Reference, B.X. 1710.)

CHEMICALS FOR EGYPT.—The Ministry of Finance, Egypt, is calling for tenders to be presented in Giza by June 10, 1925, for supply of photographic paper and chemicals. (Reference, B.X. 1708.)

Tariff Changes

FIJI.—A Proclamation prohibits absolutely the importation of omnopon, omnopon-scopolamine, and the "Tubunic" brand of morphine and diamorphine tablets.

NEWFOUNDLAND.—The Alcoholic Liquor Act, which deals with the purchase, sale, and possession in, and the importation into, Newfoundland of alcoholic liquor came into force on February 3, 1925.

UNION OF S. AFRICA.—A Proclamation imposes on cement imported into the Union from Sweden after February 20, a dumping duty equal to the difference between the price at which cement of a like grade is sold for home consumption in Sweden, plus the f.o.b. charges, and the selling price f.o.b. to the importer in the Union; provided that the dumping duty shall not in any case exceed 25 per cent. *ad valorem*.

A Proclamation imposes in the Union on asbestos-cement sheets manufactured in or exported from France, an exchange dumping duty equal to the difference between the f.o.b. price of the sheets as charged to the importer in the Union and the f.o.b. value thereof computed at the rate of not more than 70 francs to the pound sterling, provided that the dumping duty shall not in any case exceed 50 per cent. of the value so computed, and further that the duty shall not apply to asbestos-cement sheets the c.i.f. price of which to the importer in the Union is not less than 1s. 6d. per square yard, such price when quoted in French francs to be computed at the rate of exchange current at the date of shipment.

ITALY.—Special coloured glass may now be imported duty free.

LATVIA.—A Law prohobits the importation and exportation of manufactured opium products. Opium, morphia, heroin in a raw condition, and other opium alkaloids and preparations containing more than 0·2 per cent. of morphia or 0·1 per cent. of heroin, cocaine salts and derivatives with over 0·1 per cent. cocaine contents, as well as other narcotic materials having similar effects, may only be imported and exported under permits issued by the Health Department.

MOROCCO (FRENCH ZONE).—The importation of cotton seed, coming directly or indirectly from Egypt, is prohibited.

FRANCE.—A Bill has been introduced into the French Chamber of Deputies to increase from 2 to 5 the "coefficient of increase" applicable to the Customs duty on lithopone. The effect of this measure would be to raise the "Minimum" Tariff duty on this product from 20 to 50 frs. per 100 kilogs.

Death of Mr. J. A. E. Rayner

MR. JOHN A. E. RAYNER, managing director of the United Alkali Co., Ltd., died suddenly on Tuesday while playing golf on Worplesdon course, Surrey. He was 66 years of age.

Mr. Rayner had been connected with the chemical industry from the commencement of his business life, and was formerly associated with the firm of A. G. Kurtz and Co., of St. Helens, one of the constituent concerns of the United Alkali Co. He had been a director of the latter company since its inception, and was well known on the Continent, particularly in Germany, France, and Spain. The story of his life can best be shown in the history of his firm.

Mr. Rayner was possessed of a genial personality and charming manner that made him a popular personality in the many phases of the industry with which he came into contact. A proficient musician, he was a great lover of the art, a fair linguist, and one who could claim considerable acquaintance with foreign literature.

Chilean Nitrate: Directors' Policy

THE Chilean Nitrate Committee in London state that the directorate of the Association has continued to consider with very great care the scheme previously detailed for protecting new purchases of nitrate for April/May shipment by a fall clause. At the meeting of the directorate in Valparaiso on Thursday, April 2, it was decided not to introduce a fall clause for any market. In the opinion of some dealers and producers the introduction of a fall clause to operate with respect to stocks held in delivery ports on June 30 would be equivalent to reducing the price of nitrate for May shipment. The directorate is determined, even at a sacrifice of the immediate interests of the Association, to maintain good faith with the market by the most scrupulous consistency with its public declarations. For this reason the fall clause scheme is abandoned, even although this may probably have the effect of causing a scarcity in May and June in the United States, Japan, and some other important markets.

Artificial Silk Manufacture

"ARTIFICIAL SILK: a review of British progress" was the subject of a paper by Mr. Shearer, editor of the *Textile Mercury*, at Manchester on Saturday, April 4. Mr. Shearer briefly outlined the manufacture of viscose. Cellulose in the form of wood pulp made from spruce pine was mercerised and pressed, and then broken up into a light mass known as "crumbs." These "crumbs" were treated with carbon bisulphide and dissolved in dilute caustic soda. When the solution was ripened and filtered it was ready for spinning. The viscose, now a thick, sticky fluid, was then pumped through a series of fine holes into a coagulating bath, and emerged as fine filaments. In an average yarn there were about 40 such filaments, each equivalent to 1,400's cotton counts. Speaking of its uses, Mr. Shearer said that artificial silk, as it was known to-day, was not fitted to displace the older fibres, would not, indeed, be used considerably by itself, though it would help the textile producer to create new fabrics and to improve the older ones.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

SHARP (J.) AND CO., LTD., Salford, dye manufacturers. (M., 11/4/25.) Registered March 24, £1,250 deb., to H. Birch, Hillcrest, Llangollen; general charge.

SPEDOL MANUFACTURING CO., LTD., Brentford, paint manufacturers. (M., 11/4/25.) Registered March 26, £350 2nd debs. part of £5,000; general charge. *£8,050. November 27, 1924.

WILLOWS, FRANCIS, BUTLER AND THOMPSON, LTD., London, E., druggists. (M., 11/4/25.) Registered March 24, Land Registry charge, to Bank; charged on 89A, Shacklewell Lane, Hackney. *£4,000. March 25, 1924.

London Gazette

Companies Winding Up Voluntarily

BAKHTIARI OIL CO., LTD. (C.W.U.V., 11/4/25). By special resolution March 13, confirmed March 30; J. Ivan Spens, C.B., 4B, Frederick's Place, Old Jewry, London, appointed liquidator, and authorised to carry into effect agreement dated February 12, 1925, for the purchase of the property, assets and undertaking of the company by the First Exploitation Co,. Ltd. Meeting of creditors will be held at Liquidator's office, on Wednesday, April 15, 1925, at 12 noon. (This notice is purely formal, being given to comply with the provisions of the Companies Acts. All creditors have been or will be paid in full.)

CHEMISTS' SUNDRIES LTD. (C.W.U.V., 11/4/25). N. Hoyle, incorporated accountant, 1, Royal Chambers, St. George's Square, Huddersfield, appointed liquidator, March 31.

Partnership Dissolved

BROWN (R. B.) AND CO. (Reginald Busby BROWN, Percy Edgar WICKHAM), manufacturers and dealers in dyestuffs, and as dyers, 45, Finsbury Square, E.C. By mutual consent as from March 31, 1925. Debts received or paid by R. B. Brown and P. E. Wickham.

New Companies Registered

R. B. BROWN AND CO., LTD., 45, Finsbury Square, London, E.C. To acquire that part of the business of R. B. Brown and Co., which consists of the purchase and sale (wholesale or retail) of dyestuffs and chemicals, and the agencies for Scottish Dyes, Ltd., and for the Indigo Marketing Agency, Ltd., of Calcutta. Nominal capital £20,000 in 14,000 first and 5,000 second preference shares of £1 each and 20,000 ordinary shares of 1s. each.

A. DEVON AND SON, LTD., 128, Peter's Hill, Belfast. Manufacturing chemists, etc. Nominal capital £3,000 in £1 shares.

THE FAIRFIELD DYEING CO., LTD., Clay Hall, 497A, Old Ford Road, London, E.3. To acquire from R. B. Brown and Co., of 45, Finsbury Square, London, that part of the business carried on by them which consists of dyeing, bleaching and cleaning, and to carry on the business of dyers, cleaners, bleachers, etc., manufacturing and general chemists and druggists, analysts, or analytical chemists, etc. Nominal capital £5,500 in £1 shares.

FRANK HOW AND CO., LTD., Trogan Wharf, 77-83, High Street, Stratford, London, manufacturers, blenders and importers of lubricating and other oils; manufacturers, refiners and preparers of and dealers in oils and oleaginous substances, drugs and chemicals, etc. Nom. cap. £20,000 in £1 shares (5,000 7½ per cent. preference and 15,000 ordinary).

KIESELGUHR PRODUCERS, LTD., 15, Seething Lane, London, E.C. Producers of and dealers in kieselguhr, silica and similar substances. Nom. cap. £1,000 in £1 shares.

DAVID NELSON, LTD., 168, Dumbarton Road, Partick, Glasgow. Drysalters, oil and colourmen; manufacturers of and dealers in chemical, industrial and other preparations, etc. Nominal capital £1,000 in £1 shares.

PREVENSCAL MARKETING AND BOILER CLEANING CO., LTD. Dealers in paints and solutions for removing scale, fur, rust and other deposits from boiler plating and boiler tubes, etc. Nominal capital £5,000 in 2s. shares. Solicitors: Perowne and Co., 7, Great James Street, Bedford Row, London, W.C.

Australian Fuel Production

EVIDENCE on the question of the possible production of oil in the Commonwealth is still being taken by the Federal Public Works Committee. In Melbourne last week Mr. Essington Lewis, general manager of the Broken Hill Proprietary Company, tendered information regarding the activities of his company in the production of benzol. The present output of benzol at the Newcastle Steel Works amounted to 23,000 galls. weekly. The company would not attempt to manufacture benzol purely as a primary product. They had been approached by three people who proposed to make power alcohol, with the idea of taking the whole or at least part of their output of benzol to mix with power alcohol. Experiments conducted by the Broken Hill Company and the Colonial Sugar Refineries Company had proved that though power alcohol could be used by itself, it was a very much better spirit if used with benzol.

Mr. A. E. Leighton, Controller-General of Munitions Supply, detailed work done by the Defence Department on the fuel question. He said that the Department had been supplying the Postal Department with a fuel of alcoholic properties for motor transport. It contained 67·5 per cent. of alcohol, 22·5 per cent. benzol, and 10 per cent. ether. To the mixture was added a small portion of wood naphtha and of pyridine. That fuel had been given a severe road trial, and had proved quite satisfactory. A second mixture was composed of alcohol, 50 per cent.; benzol, 40 per cent.; and ether, 10 per cent.; and it had been used in the munitions works at Maribyrnong for the last four weeks with great success. Experience had shown that the mileage value of the first mixture was 75 per cent., and the second mixture of 90 per cent. of that of petrol.

Research in Metals

THE valuable work being carried out by the British Non-ferrous Metals Research Association in linking up industry and science in the cause of technical and commercial progress, was commended by several speakers at a luncheon which the association gave in London on Friday, April 3. Mr. Thomas Bolton, the chairman, said it was believed they would discover in the near future a non-ferrous alloy which would do what had hitherto been considered impossible in those parts of engines employing steam at a very high temperature.

Sir Robert Horne said that if scientific research did anything, it was to achieve in the end a cheaper production. The process of knowledge, the advancement of scientific investigation, affected industry and commerce in the long run by giving a better article for less money, and that was the object which everyone interested in British industry should desire to achieve.

Engineer Vice-Admiral Sir Robert B. Dixon (Engineer-in-Chief of the Fleet) announced that the Navy was at present particularly anxious to obtain a metal or an alloy, ferrous or non-ferrous, which would stand a load of 3,000 lb. per square inch, without creeping or scaling, at a temperature of 800 or 850 Centigrade. Investigation into the corrosion of condenser tubes was also more important.

Mr. Douglas Vickers and Mr. H. T. Tizard (Department of Scientific and Industrial Research) also spoke.

Amongst others who had accepted invitations to be present were:—

Sir Alfred Mond, M.P., Sir R. Redmayne (Chairman Imperial Mineral Resources Bureau), Dr. W. Rosenhain (National Physical Laboratory), Professor T. Turner (President Institute of Metals), and Mr. Emile Mond.